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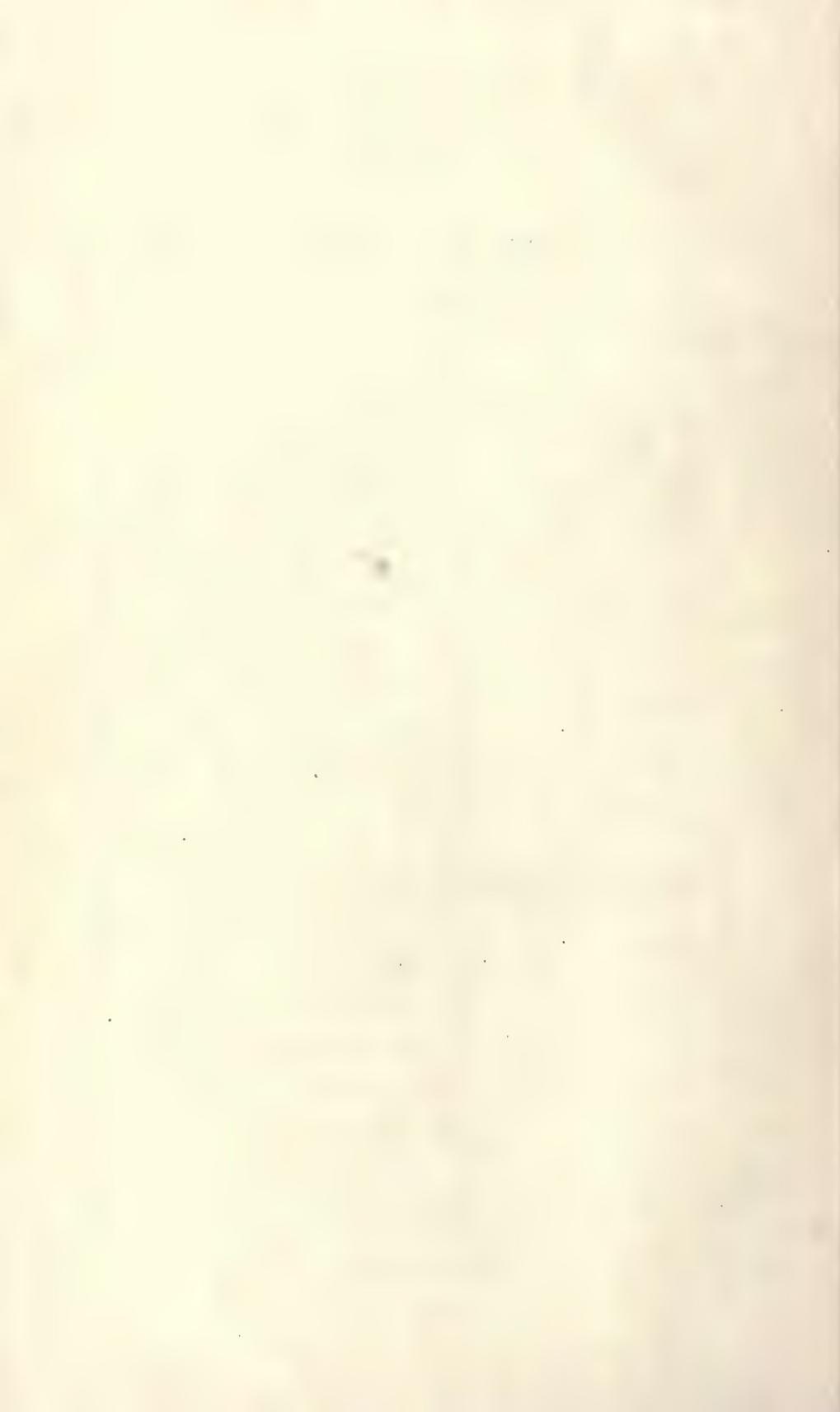


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AMERICAN VETERINARY REVIEW.

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EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, August 15, 1910.

SERO-THERAPY AND ANAPHYLAXY.—Sero-therapy is gaining ground rapidly almost every day; and many already are the diseases that are now controlled by this mode of treatment. There has been, however, some instances where accidents have occurred by the fact of sero-therapy treatment, which are likely to be sufficient to limit temporarily the practice recently introduced. Instances of this may be taken from the report that I read in the *Presse Medicale*, where are related the history of three observations of cerebro-spinal meningitis treated by the use of antimeningococcic serum, which had given in the treatment of this disease marvelous effects. In these three observations the injection of the serum had been done in the vertebral canal for several days in succession and the three cases ended fatally. In the presence of such results the important question which presented itself was, *What was the cause of those accidents?*

To which the proper answer was that it seemed to be that they were anaphylactic accidents, and that anaphylaxy was the cause of these deaths. These accidents presenting in fact great analogies with similar clinical accidents observed by Besredka in his experiments.

Guinea pigs, which had twelve days before received a small subcutaneous injection of equine serum, were inoculated by Besredka under the dura mater with $\frac{1}{4}$ of c. c. of the same serum.

Immediately these animals exhibited very severe accidents (convulsions, collapsus), and almost all died in two or three minutes. Sensibilized guinea pigs do not react, if instead of equine serum another liquid is injected in their brain, and likewise fresh animals had no visible trouble after the intra cerebral injection of $\frac{1}{4}$ of c. c. of horse serum. These experiments show, therefore, that anaphylactic accidents are constant after the intra-cerebral injections and only noticed in 25 per cent. of animals where the injections are made in the peritoneum or in the veins. And again, while a dose rather large (at least 5 c. c.) may give rise to accidents by intra-peritoneal injection, a minute dose is sufficient to produce these if injected by intra-cerebral inoculation. Accidents of serial anaphylaxy are then more to be feared when the serum is injected in the proximity of the nervous centers.

To remedy this dangerous condition, a preventive treatment against anaphylactic troubles has been looked for by many experimenters. Attempts to modify the serum by physical or chemical agents, so as to reduce or to suppress its toxicity without modifying its therapeutic properties, the action of heat at 100° C. for twenty minutes or again at 50° for an hour during four days. But the results have not been entirely satisfactory.

As the toxicity of the serum could not be suppressed, it was attempted to try to act upon the sensitized animal himself in rendering him refractory to a new injection of serum. The action of anaesthetics, ether or alcohol, was tried. They confer an antianaphylactic immunity undoubtful, but it is only of short duration. A lasting immunization against serial anaphylaxy can be obtained in vaccinating animals with the serum itself.

Besredka has proposed a simpler and easier way to be applied practically. To render a guinea pig refractory to the fatal injection of a deadly dose of serum in the brain, all there is to do is to inject the day previous or only several hours before, a small quantity of serum in the rectum. Or again to inoculate under the skin an extremely weak dose of this serum.

This method has just been put in practice in Roumania by Alexandresca and Ciucia. In that country, to vaccinate bovines

against bacteridian anthrax, a mixture of vaccine and anti-bacteridian serum is used. As the animals are vaccinated at least once every year and in case of epizooty several times a year, they often present slight or again serious anaphylactic accidents. To avoid them, Alexandresca and Ciucia resorted to the method of Besredka. Having 180 head of cattle to vaccinate, they divided them in two lots of ninety each. Those of one lot received an injection of 1 c. c. of antibacteridian serum under the skin, then five hours after the vaccinating mixture of 5 c. c. of serum and 1 of vaccine. None of the animals presented serial accidents. The animals of the other lot received the same dose of the mixture of serum and vaccine, without having had the previous injection of a small quantity of serum; they manifested anaphylactic accidents in the proportion of 1 out of 9.

A last method to overcome these accidents as long as they are quite rigorously specific, would be to inject into subjects sensitized by a first injection of equine serum, that of another animal, sheep serum for instance. Of course much yet remains to be found out, but as far as the prophylaxy in veterinary application is concerned, the experiments of Roumania deserve much attention.

* * *

EXPERIMENTAL TREATMENT OF PIROPLASMOSIS.—Judging from veterinary literature, no treatment has been known to this day, possessing a curative action on piroplasmosis, and yet they are affections which cause enormous losses principally in America, in Africa and Australia, as well as in some other countries where the mortality is at times very high. To find a curative treatment was, therefore, an important practical question, and according to *Parasitology*, two learned professors of the University of Cambridge, G. Nuttall and S. Hadwen, seemed to have succeeded in finding one in the use of two special tinctures, the trypan-blue and the trypan-red. They first experimented with it on dogs and afterwards on bovines, and for both species the results have been very satisfactory. These have been resumed

in a special work from which interesting conclusions are here presented.

In relation to canine piroplasmoses, after considering the drugs which have proved inefficacious, those of doubtful value and those which seemed to have produced some effects, G. Nuttall writes on the positive curative or preventive effects obtained by the use of trypan-blue: "This drug has indeed not only a curative effect, but when it is used early it may prevent the apparition of the parasites in the blood of dogs. Without effects when given per mouth, it must be injected sub-cutaneously or in the veins in doses of 5, 10 or 20 c. c. of a 1 per cent. solution, according to age and weight of the animal. Trypan-red can also be used, but its properties are more irritating. In dogs cured by this treatment, the blood remains infectious for six or seven months or even more, after treatment. They resist reinoculations with virulent blood taken from dogs affected with acute piroplasmosis. Trypan-blue and trypan-red have an action which is easy to appreciate. It is first indicated by the rapid disparition of the parasites. Those that remain are rounded, degenerated and finally cannot be detected with the microscope, and although they may reappear again in small number after few days, their presence is no longer manifested by external symptoms and the animals recover rapidly. Relapses may eventually occur again with the reappearance of the parasites, but they are very rare. The influence of the treatment on the fever is very marked. The temperature soon returns to normal and an acute attack is cut short. Recovered from this, dogs keep for a long time parasites in their blood, and if they are not literally cured they are at least "white washed."



The conclusions of the investigations of Nuttall and Hadwen on the application of the treatment in bovines can be concisely resumed. Trypan-blue promises to be an efficacious treatment against bovine piroplasmosis as the effects of the drug upon the *P. Bovis* is similar to that it has in dogs. The dividing forms are

the first to disappear, then the pyriform and the parasites appear degenerated, round or irregular. After from nine to forty-five hours or less, all have disappeared from the blood. As in canine piroplasmosis, their disappearance may be temporary. Any how, the parasites disappear and reappear in animals which recover naturally. In some, they have returned in very small numbers after five or six days, while in others after sixteen or eighteen animals show no more symptoms and recovery follows:

It remains to be found out: 1. How long can the blood of animals treated show parasites after apparent recovery? 2. If the virulence of these parasites is attenuated in those animals thus recovered. 3. Can ticks be infected by the parasites?

The authors have experimented upon nine cows. Four were used as witnesses, five were treated with trypan-blue. Among the witnesses two took hemoglobinuria and one died, the other two had no hemoglobinuria and their disease was mild. Among the five treated all took hemoglobinuria and all recovered. In four of them hemoglobinuria was present before the treatment was begun.

The drug has always a more rapid action when given by intravenous injections. Doses of 100 to 200 c. c. in aqueous solution of the tincture were used, but smaller doses may prove as efficacious. Trypan-blue does not seem to have bad effects on cattle, but there is an objection to its being used: it colors the tissues and principally the subcutaneous. How long will this coloration last is interesting to know, as the animal is to be used for breeding or slaughtering.

Extensive experiments are to be made to demonstrate the practical value of the drugs, which, according to the authors might also be tried in the treatment of some blood parasitic diseases of sheep and also in bilious fever of horses.



TUBERCULIN IN DOMESTIC CARNIVOROUS ANIMALS.—Although the general application of one of Koch's discoveries, tuberculin, in veterinary medicine has given occasions for many valuable communications and the establishment of facts relating

to its use in the diagnosis of tuberculosis, and although the very different ways to take advantage of its properties have been time and time again related, there is probably a point which in our medicine is in need of more positive information than those that can be gathered from writings on the subject. That is the utilization of tuberculin in smaller domestic animals, dogs and cats. Among the many competitors for the prize that the late Director and Professor Trasbot has left to the Société Centrale de Médecine Vétérinaire, there is one from adjunct Prof. M. Douville, of Alfort, on "Tuberculosis of Domestic Carnivorous Animals," (dogs and cats), with researches upon its clinical diagnosis and of which the larger part of the prize was given.

In that paper, Douville has treated extensively the question of the clinical diagnosis, and to confirm it rapidly he calls the attention to two methods to be readily applied: the research of the bacillus and the use of tuberculin. It is to this that I may be allowed to allude to-day, hoping that it will throw some positive light on the question by taking the conclusions presented:

1. With tuberculous dogs, tuberculin has an undoubted specific action, indicated specially by a noticeable elevation of temperature.
2. According to the size of the animal, sub-cutaneous injections of from 5 to 15 centigrammes of tuberculin, produces ordinarily a rise in the temperature of 1 or 2 degrees, more seldom of 3.
3. The same dose injected to non-tuberculous dogs does not promote any appreciable rise.
4. The *febrile reaction* takes place *early*, appearing more commonly between the fifth and seventh hour after the injection, sometimes between the ninth or tenth. It lasts always several hours (four or five in average), and is often accompanied by general reaction (dullness, depressed condition, chills).
5. The duration and intensity of the reaction is not in proportion of the extent or severity of the lesions. It even seems more marked when the lesions are limited. *Open tuberculosis gives typical thermic reaction (2 to 3 degrees).*

6. With very extensively diseased and worn out subjects, there is almost no reaction. The temperature must be taken morning and evening, at least forty-eight hours before the injection, and the test is not to be applied, only when it is not above 39° . *It is necessary for the temperature to reach at least 40° and remain there for three or four hours* for a dog to be declared tuberculous. A thermic ascension equal or superior to 1.5° is not sufficient.

7. General reaction is not always present. The tuberculous toxin is not always hyperthermizing. It has been followed by a drop in the temperature in two cases.

8. Dogs like bovines present accountumancy, but it is of short duration.

9. Failures may occur in 40 per cent. about of the cases tested; so much more frequently in severe and extensive tuberculosis. They have however, been noticed also in animal carriers of limited lesions.

10. Cats react poorly. Old subjects require only one-third or one half c. c. at the most. Free from tuberculosis, but having other senile organic lesions, they are very susceptible to tuberculin. Cuti, ophthalmic and intra dermic reactions have given Douville results not as satisfactory as the subcutaneous injection.

* * *

RABIES IN RUMINANTS.—The symptoms of bovine rabies have often attracted the attention of observers by their varieties, and veterinary publications as well as classical works have related them. In the *Revue de Pathologie Comparee* a long analysis has appeared on the clinical symptoms of rabies in huminants by veterinarian Bissauge, who gives of them the following good description.

Large Ruminants.—In the *dumb* or *quiet* form the animal remains calm; it only seems at the beginning of the disease, as if disturbed by a strange and motiveless anxiety; it carries the head high, and the dilated condition of the pupils of the eyes give them an unusual glance. The animal has spells of tem-

porary hallucinations and strikes with its horns or feet at imaginary objects. These spells are very short and often overlooked. In the digestive apparatus, the symptoms appear early. First the appetite is capricious, then comes complete anorexia, no rumination and signs of acute pharyngitis; swallowing is difficult first and then impossible. Saliva is foaming, abundantly flowing from the mouth. True hydrophobia does not exist and depraved appetite is the exception.

The test with a dog is far from being as important as it has been thought for a long time. All cattle have the habit of defending themselves more or less vigorously against any dog approaching. A symptom already very peculiar is the early apparition of a strong and continued tenesmus of the rectum. The point of inoculation is sometimes the seat of great itching. In both sexes genetical excitement is much marked. After twenty-four or forty-eight hours there is always weakness of the hind quarters. The animal moves with difficulty, walks staggering, it is hard for them to rise, and finally they cannot do it; paralysis is progressing and death follows.

Raving rabies offers a more accentuated picture. Irritation is greater, aggressive movements more serious, strong and frequent. The animal moans continuously, is excited by the slightest noise, light and specially man's voice. The uneasiness lasts longer, the animal strikes and scrapes the ground with his feet; he rushes against the manger if he is tied in the stable. Sometimes he bites his chain or the hay rack. He does not try to bite man or animals, but strikes at them with its natural means of defense. These spells are violent and intermittent.

Small Ruminants.—They are somewhat similar to those observed in cows. In the beginning there are frequent snuffling and grinding of the teeth. Animals are uneasy, become greatly excited and run in all directions carrying the head high. Their features ordinarily so quiet, suddenly assumes an expression of shyness as if they were wild, which is due to the dilatation of their pupils. Early, they have hallucinations and aggressive movements towards imaginary enemies. To the paroxysms of

excitement succeed periods of calm, when the sheep remains quiet, immobile with his head down, as in a state of coma. The rabid sheep has more than cattle a tendency to use his teeth against man, animals or surrounding objects. The region where it has been bitten is the seat of a very severe itching, and the sheep licks it or bites it with rage, without showing any pain. Death by general paralysis occurs in four or five days.

* * *

PEROXIDE OF HYDROGEN IN PNEUMONIA.—Having an outbreak of infectious pneumonia among a number of horses to deal with, an army veterinarian, Mr. Bonchet, decided to treat them with peroxide with the hope of helping the hematosis in his patients. His experiment is related in the *Revue Generale* where the case of his two pneumonics are recorded.

The oxygenated water he used was a solution at 12 volumes free from all impurities and without excess of acidity. The injections were intravenous and made in the jugulars. A few, however, were in the saphena, the spur vein and that of the forearm. Injected with the syringe of Pravaz, in doses varying between 40 and 150 c. c.; no more than 150 c. c. were ever given in one animal. Among the phenomena following immediately the operation, he observed that all the animals felt the injection, even in small doses. They presented a polypnea, sometimes a true dyspnea with increased and fuller inspiration, dilatation of the nostrils with an anxious glance and features. This was followed by evacuation of feces, accompanied with slight colic. After 10 or 15 minutes all these manifestations had passed off.

With peroxide the temperature is lowered. After each injection and as in direct proportion to the quantity of the injection, there always was a manifest drop in the temperature $6\frac{8}{10}$ of a degree and even of 1 full degree. For this reason it is better to divide the dose and give one in the morning and the other in the evening. The doses employed varied according to the elevation of the temperature and the thermic modifications presented, corresponding oscillations in the curves of the respiration, and circulation. The general condition improved every

day under that treatment, and not a single case of death or complications was observed. There were only two mild accidents. One horse had a bad spell of coughing as the injection was made, and at once an hemoptisy took place which lasted a few minutes. It did not return. The other, by a sudden movement while being injected, the trocar of the syringe was displaced and some of the peroxide was pushed in the cellular tissue surrounding the vein. A thick swelling resulted alongside the jugular. By proper treatment this subsided, but there remained a temporary obliteration of the vein which disappeared with due time. From this description it is certain that peroxide has given in this circumstance very handsome results.

Does the treatment deserve a place in the chapter of the therapy of pneumonia? Why not. It is easy to administer, not expensive, neat, without danger, can be carried out quickly and may justly be substituted to the administration of drugs per mouth. Can it be the only internal treatment to be used against pneumonia? Probably no. But it will prove a superior adjunct. Specially after its use has been improved.

So says Mr. Bonchet. Will others try it?



ON TUBERCULOSIS OF EQUINE ORIGIN.—Although tuberculosis is comparatively rarely met with in horses, and probably in some instances only as surprises of post mortem, their lesions, characters and virulent properties may not have received the attention that their close studies might suggest. And yet some interesting facts will spring out as in all scientific questions; they stimulate the researches of inquisitors and the results of the work done with possibly new discoveries or valuable statements are made known by the scientific press. Such has been the case following the discovery of three cases of tuberculosis in horses which was made by Drs. Morel and Julian and which gave them the opportunity for making some experimental researches with the tuberculous bacilli that they found in the lesions.

In one of the horses they found the sarcomatous form of tuberculosis with tubercles and caseous pneumonia, in the other

two they met with the miliary pulmonary tuberculosis and abscesses in the spleen. These diseased processes were accompanied with lesions which contained bacilli. They made cultures with the pus from the spleen and lungs in various media, glycerinated potatoes, horse serum, gelose, etc., and made numerous inoculations on guinea pigs, rabbits and pigeons, and related their experiments before the Société de Pathologie Comparée at one of its meetings. They offered the general following conclusions:

1. Purulent tuberculous lesions and those with the sarcomatous form of the lungs are extremely rich in bacilli of Koch, contrary to those found in the miliary form.
2. These bacilli are very difficult to cultivate on classical glycerinated media, at least judging by the very numerous attempts that they have made and even after passage by guinea pigs and rabbits.
3. These animals are susceptible to the equine bacilli, but their reaction differs in duration and localization of the lesions, according to the mode of inoculation.
4. Pigeons inoculated by intramuscular or peritoneal injections even in repeated and massive doses (2 c. c.) are absolutely refractory.
5. Guinea pigs that were inoculated in the peritoneum died in 30, 31, 51, 71, 86 and 125 days with tuberculous peritonitis and glandular generalization. Those inoculated under the skin resisted 78, 104, 107, 188, 215 days. They presented the same symptoms and lesions.
6. Out of four rabbits inoculated, two died with acute miliary tuberculous peritonitis, one in 19 and the other in 34 days. The other two inoculated are yet living after 90 days. Rabbits inoculated under the skin resisted between 66 and 210 days. At post mortem of those, massive pulmonary lesions, very rich in bacilli were present.
7. The virulence did not seem to increase by passage from one guinea pig to another or from rabbit to rabbit.



RESORPTION OF TUBERCULOUS LESIONS IN BOVINES.—Prof. Calmette and C. Guerin made recently a communication before the Académie des Sciences of great importance relating as it does to vaccination of cattle against tuberculosis.

In preceding researches they have shown that the properties of the tuberculous bacillus could be modified by cultures, in series, on cooked potatoes, in pure bile of cattle, glycerinated at 5 per cent. and in presence of an excess of fluid.

Actually the two experimentators have a bovine bacillus of 23d passage, very little virulent for small animals of experiments, and which is tolerated very well by young bovines. Injected in doses of 100 milligrammes by intravenous injections, it gives rise to a typho-bacillose which lasts about one month, after which the animals have recovered, although they keep and also have for a long time after living bacilli in their bronchial glands. There is not immunization of the animal which has received the injection, but he is rendered more tolerant to the bacilli. Then taking serum from an animal hyperimmunized with bacilli cultivated on bile, which possesses a very great agglutinating power. Calmette and Guerin put it in contact during forty-eight hours with bacilli, cultivated on bile and in fine emulsion. This mixture, injected in the veins of bovines, considerably stimulates the resorption of the bacilli in the organism. Animals that have received the injections and which thirty days after the inoculation of the bacillus-serum were then injected intravenously with three milligrammes of very virulent bovine virus, were killed after 60, 90 and 120 days. The inoculations of their bronchial and mediastinal glands to guinea pigs showed that the virulent bacilli were almost completely resorbed after 90 days and totally after 120. In animals of control, inoculated at the same time with the same biliated bacilli without serum, the testing bacilli remained virulent in the same glands beyond 120 days.

These researches of the professors show for the first time that it is possible to have the organism resorb, in a relatively short time, 90 and 120 days very virulent bovine bacilli. It

seems as if a new practical and efficacious method to vaccinate bovines against tuberculosis might be found by this new discovery of the learned investigators.

* * *

A LITTLE BIBLIOGRAPHY.—I believe that it is general with good students of medicine, almost as soon as they begin their studies, to provide themselves with a medical dictionary. As a rule these are good books. Those of Dunglinson, Keating, Thomas, J. S. Billings are well known amongst them, and yet some are possibly superior to others; or again some more complete than others. One objection, however, that may be applied to almost all is that they are not always up to the latest requirements. How could they be with the constant progresses of science, and consequently that while they contain the definition of most all the terms used in medical sciences, as perhaps years may have elapsed between the revision of a new edition, it is certain that in the space of time new words have found their way in current phraseology and use, and either the student or the practitioner that comes before them is at a loss for a definition which he cannot find in his dictionary, even the best known to him or his confrères.

Is there a remedy? I believe the little work which two physicians, MM. Garnier and Delamare, have issued here fills to a certain extent the want and might be followed by other writers. Their book is entitled "Dictionary of Technical Medical Words" (*Dictionnaire des termes techniques de medecine*). I say it fills the want because I find in it a number of words whose definition I think ought to be there, and that I have failed to find in other dictionaries. I must, however, say that my collection goes back to several years, and perhaps new editions that I do not possess do what I am complaining of. It might be wise if works on biology, bacteriology and sero-therapy would give a concise dictionary of new terms as an index for the benefit of their readers. To substantiate these remarks, I may be permitted to give the definition of a few words which are of frequent use in recent

years and which students as well as medical readers may be pleased to possess and so avoid a useless research in their dictionary. In so doing I only imitate other medical and veterinary publications.

Agglutinine.—Substance contained in some sera, which has the property of gathering in an incoherent mass either the red corpuscles of the blood or the bacilli of a culture.

Aggressine.—Peculiar substances secreted by some bacterias and possessing an aggressive action towards the cells of the organism.

Alexine, Cytasis, Complement.—Albuminoid substance possessed of bactericid properties and which exist in all the seras. It is destroyed by heat at 55° C.

Antigene.—General term for all substances, microbes, toxines, red corpuscles of another species, etc., likely to promote the formation of anticorps.

Anticorps.—Any antagonistic substances, taking the defense of the organism: the hemo-agglutines and hemolysines against the red corpuscles, the bacteric-agglutines and bacteriolysines against microbes, the antitoxines against toxines. They are the agents of acquired immunity.

Bacteriolysis.—Dissolution of the bacteries. Action of certain liquids of the organism upon microbes.

Bacteriolysines.—Anticorps which attack microbes.

Hematolysis, Globulisis, Hemolysis.—The alteration or destruction of the red corpuscles by the anticorps. This destruction is characterized by the difference in diffusion of the hemoglobine outside of the corpuscle.

Hemolytic Sera.—Those that have the property to destroy the corpuscle.

Lysines.—General term applied to substances having the property to dissolve the red corpuscles, cells of tissues, bacterias and which reveal their presence only by this property.

Opsonines, Stimulines.—Substances able to combine chemically with microbes, to prepare them for phagocytosis. They

exist in the serum of fresh subjects and more abundantly in individuals artificially immunized.

Precipitines.—Substances formed in the serum of an organism when it is attacked by an antigen and which are able to give rise to the formation of a deposit in the serum of an organism attacked by the same antigen.

Sensibilatrice Amboceptor or again immunizing body, fixator, immunisine, phylocytasis.—Substance appearing in the serum of an animal, in which has been injected a microbe (vaccination) on an emulsion of red corpuscles, cells or albuminoid matters (antigen). It has the property to render susceptible to the action of alexine the microbe against which the animal has been vaccinated or against the antigen which he has received. The bactericid, hemolytic or cytolitic property of such a serum is then due to the action of two substances: one specific resisting a temperature of 55° C. called *Sensibilatrice*, and the other non-specific, anterior to the vaccination, existing in all the sera, destroyed at 55° and for which the name of *Alexine* is reserved.

A. L.



THE SAN FRANCISCO MEETING—PERSONNEL OF INTERNATIONAL COMMISSION ON THE CONTROL OF BOVINE TUBERCULOSIS.

The great and enthusiastic gathering of veterinarians at San Francisco last month has borne out the REVIEW's prophecy in its September number, and during the entire year in fact, that the meeting on the Pacific slope would be the "greatest veterinary convention ever held in this country." For, while it was not the greatest from a numerical standpoint, we believe it may be justly accorded to be the greatest in things accomplished.

It was a great achievement on the part of the veterinarians of the Pacific slope in the first place, to have induced the association to meet so many thousands of miles further west than it had ever done before; and was a greater achievement on their

part to have arranged so perfectly for their transportation and entertainment in the magnificent manner in which it was done. What the association achieved in making that trans-continental trip is incalculable, but we believe it to be the greatest achievement in its history. It has no precedent. It began its achievement for good to the profession from the moment that the "AMERICAN VETERINARY SPECIAL" cars left Chicago, by impressing the public with the importance of the mission of their occupants in taking a line of Pullmans across the continent. Then think of the great good that was accomplished for the profession in the northwest as the train halted at the important cities of Spokane and Seattle, bearing to the chambers of commerce of each of those municipalities, who were their guests, nearly four score of the colleagues of the veterinarians of those cities; earnest men, filling the most important posts in the veterinary profession, both in the United States and Canada, journeying to the Pacific coast to discuss plans calculated to serve the live stock interests, and, consequently, the agricultural interests of both countries; to say nothing of the effect it had all along the line, even where it stopped but an hour or a fraction of an hour, picking up recruits in some instances, and receiving "God speed" from colleagues who were unable to join the party in others; but always leaving an increased respect for the profession with the townsmen of the veterinarians of each place.

And, finally reaching the host city, where they found their colleagues of the "Golden West" waiting to receive them in a marble palace which they had deemed fitting as the headquarters of so important an organization, the *real* work of the convention was begun, which it will not be necessary for us to review here as a full account of the proceedings appears in this number. But there is one phase of it that we feel we cannot pass over without a word of commendation; especially as it is a new feature of the work of the organization, the importance of which we referred to at the close of the Chicago meeting where it had its birth—the INTERNATIONAL COMMISSION ON THE CONTROL OF BOVINE TUBERCULOSIS. No one can read the report of that

commission, which will be found on page 101 of this issue of the REVIEW, with its appendices, without being impressed with several things in connection with it: First, with the immense amount of work that has been undertaken and accomplished; second, by the quality and character of the work; next, by the number of well-attended meetings held by the commission at different points over the United States and Canada, showing how interested the commission was in the work they had undertaken, and how earnestly they were pursuing it. And so the reader becomes more deeply interested in the report of this commission, and impressed with its thoroughness until his curiosity leads him to turn over a few pages to learn who the gentlemen are that compose a committee that has been capable of elucidating so many of the knotty problems that have long been stumbling blocks to progress; that have been able to give to the world in so concise a form a series of recommendations, not only on the control, but leading to the eradication of bovine tuberculosis.

Let us look for a moment on the personnel of the INTERNATIONAL COMMISSION ON THE CONTROL OF BOVINE TUBERCULOSIS in the order that we find the names signed to the report on page 110. The first gentleman, who modestly signs himself W. C. Edwards, is the Hon. William Cameron Edwards, of Russell County, Ontario, Canada, who had been a member of the House of Commons since 1887, and was called to the Senate in 1903. Senator Edwards has for many years been president of the Russell Agricultural Society, has taken a deep practical interest in agriculture, and is a very successful stock raiser, owning a large and valuable pure-bred herd of Shorthorns on his model farm at Rockland, Ontario.

J. J. Ferguson is also a Canadian by birth, although his headquarters are Chicago. Mr. Ferguson, though young in years, has had an unusual amount of experience. He was born near Smith's Falls, Lanark County, Ontario, Canada, but thirty-six years ago; graduated from the Ontario Agricultural College in 1894, being a silver medalist in his second year; was a successful Farmers' Institute lecturer for a number of years in the

employ of the Ontario government; afterwards being appointed Professor of Animal Husbandry in the University of Michigan. Since 1905, Mr. Ferguson has been in the employ of Messrs. Swift & Company, of Chicago, as head of the Animal Foods Branch of that corporation. He also acts as their special travelling representative in both the United States and Canada.

J. W. Flavelle, the third signature, is that of Joseph Wesley Flavelle, L.L.D. Dr. Flavelle was born at Petersborough, Ontario, Canada, in 1858; went into business in Toronto in 1887, and is now president and general manager of the William Davies Company, exporters and domestic bacon curers. He is president and director of several banks, chairman of the Board of Trustees of the Toronto General Hospital, and governor of the University of Toronto.

The next signature is W. D. Hoard. This gentleman, the Hon. W. D. Hoard, Ft. Atkinson, Wis., ex-Governor of Wisconsin, editor of *Hoard's Dairyman*, breeder of registered Guernsey cattle, a gentleman of wide practical experience, and possessed of a fund of scientific information on agricultural, sanitary and pathological questions that many professional men might hope to possess; in recognition of which, and of his early endorsement of the tuberculin test for the control and suppression of tuberculosis and his splendid efforts in aiding a solution of this world-wide problem through the medium of his paper and by heart to heart talks to the profession and laymen at veterinary gatherings, farmers' institutes, etc., he was made an honorary member of the American Veterinary Medical Association last year at Chicago.

The fifth signature, C. A. Hodgetts, is that of Charles Alfred Hodgetts, M.D., C.M., L.R.C.P., graduate in medicine and pharmacy, Secretary of the Provincial Board of Health for Ontario, member of the Royal Sanitary Institute, Fellow of the Royal Institute of Pharmacy, honorary vice-president of the Association of Public Vaccinators of Great Britain, Major of the Army Medical Corps, Canada, etc., etc. Dr. Hodgetts has published a number of medical treatises on smallpox and vac-

cination, and for a number of years has been Chief Health Officer of the Province of Ontario, and Deputy Registrar General. On the first of July last, he was appointed Chief Medical Adviser to the Committee on Conservation, for Canada.

Dr. J. N. Hurty is Secretary of the State Board of Health of Indiana. The doctor's home is in Indianapolis, where his earnest work along sanitary lines has for some time been thoroughly appreciated by his townsmen. In his connection with the International Commission, he represents the American State Boards of Health.

The gentlemen whose names follow on this commission need very little mention to REVIEW readers, being well known to nearly all of them.

John R. Mohler, V.M.D., is Chief of the Pathological Division of the Bureau of Animal Industry, at Washington, D. C. Dr. Mohler is an authority on veterinary pathology and has contributed largely to the literature on the subject in the English language. His official position, too, has acquainted him with conditions of farms and farm animals in all parts of the United States.

V. A. Moore. Professor Veranus Alva Moore, M.D., Director of the New York State Veterinary College at Cornell University, Ithaca, N. Y., certainly needs no introduction to our readers, as he has been identified with the veterinary profession for a great many years as bacteriologist, pathologist, teacher, and now director of one of the foremost veterinary schools in America. Dr. Moore has been chairman of the committee on diseases of the A. V. M. A. for several years and has had a wide experience with the tuberculosis problem both in New York state and while in Federal government laboratory work years ago.

Dr. M. P. Ravenel, is also too well known to necessitate going into minute detail in regard to him, in directing attention as to how eminently appropriate was his appointment on this commission. Dr. Ravenel was for a number of years Bacteriologist to the Pennsylvania State Live Stock Sanitary Board, and is the co-author, with the late Leonard Pearson, of the following

valuable contributions to veterinary literature: "The Immunization of Cattle Against Tuberculosis," "The Effect of Tuberculosis Vaccination Upon Cattle Already Affected With Tuberculosis," "The Disinfectant Value of Ammonium Persulphate," "Formaldehyde Gas as a Disinfectant" and "The Artificial Immunization of Cattle Against Tuberculosis," reported at the International Veterinary Congress at Buda Pesth.

Dr. E. C. Schroeder, Superintendent of the Experiment Station, Bureau of Animal Industry, United States Department of Agriculture, at Bethesda, Maryland, is another gentleman well known to the American veterinary profession, whose appointment on the commission is most fortunate. Dr. Schroeder is an investigator by nature and has opportunities afforded to few to follow his investigations systematically and thoroughly, which have resulted in an immense wealth of information from original research that could be had in no other way.

Mr. T. W. Tomlinson, of Denver, Colorado, is Secretary of the American National Livestock Association; a gentleman deeply interested in livestock organizations, whose interests he represents in the commission.

Frederick Torrance, B. A., D. V. S., Director of the Faculty of Comparative Medicine at the University of Manitoba, and Secretary and Registrar of the Manitoba Veterinary Association for the past ten years, has, ever since his graduation from the veterinary school of McGill University in 1882, conducted a large general practice in the Province of Manitoba, first at Brandon and later at Winnipeg, and enjoys the reputation of being one of the leading veterinarians of Canada.

Still following the order of the names as signed to the commission's report, we reach J. G. Rutherford, Chairman. John G. Rutherford, V.S., H.A.R.C.V.S. (and if he would permit us, C.M.G. from the King of England, and we are not certain there is not also a decoration from the Italian government in recognition of distinguished services), Veterinary Director-General and Live Stock Commissioner of the Dominion of Canada, is without doubt one of the most well known and most able men in the

veterinary profession in America. Dr. Rutherford is a man possessed of a strong personality, of an extraordinary fund of knowledge, and an amount of executive ability not possessed by the average man. It is that combination of qualities in one man, recognized by the Dominion of Canada in its Veterinary Director-General and Live Stock Commissioner, and which did not escape the notice of His Majesty, King George V., that has directed the work of the INTERNATIONAL COMMISSION ON THE CONTROL OF BOVINE TUBERCULOSIS; and, with the co-operation of his distinguished associates, placed the report in the splendid form in which Dr. Rutherford presented it to the American Veterinary Medical Association at San Francisco. How fortunate the veterinary profession of America is in having such a man as a member of it who is willing to give of his time and his knowledge in instances like this, needs no reminder from us.

And finally the last signature is reached. M. H. Reynolds, Secretary. As Professor of Veterinary Science in the Division of Veterinary Medicine at the University of Minnesota College of Agriculture and Experiment Station, scientist, painstaking investigator, prolific writer, practical worker, faithful recorder, honorable gentleman, where could such another be found to fill that important position? We are certain that the personnel of the commission offers a full explanation of the character and value of the report, and have no doubt but that the wisdom of the president will insure the re-appointment of the entire body.

INVITATIONS were extended to the A. V. M. A. for 1911 from Toledo, Ohio, and Toronto, Canada. Also for 1913 from New York City; and, while no action was taken on them, the indications at the close of the convention seemed to point toward Toronto in 1911, the middle-west (Toledo, if the invitation still holds good), in 1912, with New York in 1913 for the celebration of the fiftieth anniversary of the association, that being the city in which it was organized in June, 1863.

ORIGINAL ARTICLES.

SOME CONDITIONS WHICH AFFECT PHAGOCYTOSIS.*

By B. F. KAUPP, M.S., D.V.S., PATHOLOGIST, COLORADO AGRICULTURAL COLLEGE.

Ever since the fact was proven by Metchnikoff that certain cells of the body possess the power of taking up foreign substances, much study and research have been devoted to this line of work. The power that certain cells possess of taking up foreign inert matter consists merely in the change of surface tension, caused by the microscopic object. Pseudopodia are thrown out on either side and the object gradually surrounded by cytoplasm of the cell. This is a mere flowing around, as it were, of the cytoplasm.

Further research has long ago taught us that the condition is different with living microscopic objects, which gain entrance into the body. Germs are of this class, some resisting phagocytosis others being easily phagocytized.

Metchnikoff has classified the phagocytic cells into two groups. The microphages and the macrophages, or the small and the large phagocytes. While the endothelial cells of the peritoneal and other serous sacs may become phagocytic and even proliferate to aid in the warfare against the invading enemies, and while certain cells in the lungs aid in the destruction if micro-organisms as in a like manner the Kupfer cells in the liver and cells in various other parts of the body, yet the principal cells to wage warfare against intruders as a whole are the white blood cells.

One of the principal means of defense possessed by the animal body are the phagocytic leucocytes, which have the power of migrating or finding their way out of the capillaries and passing to any part where defense is needed, or where invading or-

* Presented at A. V. M. A. meeting, San Francisco, September, 1910

ganisms are present. It is true that certain physical and chemical reasons have been advanced to explain this action.

Through phagocytic activity, by aid of the enzymes given off by the leucocytes, as well as the enzymes contained in the cells themselves, and in the fluids bathing the part, the cells of dead tissue are little by little digested, chemically changed, and gradually carried away by osmosis and by the leucocytes.

The absorption of cat gut used by the surgeon is another example of phagocytic activity.

It has been pointed out by some investigators that the lymphocytes destroy or phagocytose those micro-organisms, as the tubercle bacilli, which contain much fatty or waxy material, and the polymorphonuclear leucocytes play the principal part in the destruction of those micro-organisms which contain little or no fatty material as the pus cocci (*staphylococcus pyogenes aureus*, *staphylococcus pyogenes albus*, *streptococcus pyogenes*).

It has been argued that wounds heal at high altitudes less rapidly than at sea level or low altitudes, and that the reason of this is that as the animal or individual ascends the polymorphonuclear leucocytes decrease, and the lymphocyte proportionately increase. It has been argued that the lymphocytes being the variety that phagocytose the tubercle bacilli, the patient may, by changing to a high altitude, increase the lymphocytes, and thus the bodily resistance.

The relative proportion of leucocytes as given by various authors is as follows (nothing is said as to the altitude at which the blood was procured and observations made) :

Animal.	Polymorphs.	Lymphos.	Monos.	Eosins.	Mast.	Author.
Horse..	57	37	....	5	...	Bidanet.
Horse..	60-65	34-48	5.5	1.5	...	Cozette.
Horse..	67	22.5	5	5	...	Fischer.
Horse..	63.5	30	3.5	3	...	Meier.
Horse..	59	30	6	4	1	Moore, Etc.
Cow....	30.5	54.2	1.4	13.5	.5	Dimock & Thompson.
Dog....	68	19.4	6.3	6.1	...	Burnett.
Dog....	65.7	21	6.8	5.3	...	Busch.
Dog....	64.5	22.1	4.4	8.5	...	Dawson.
Dog....	72.5	10	17.8	3.3	...	Nicholas.

In this laboratory the author has been making some observations as to the relative proportion of the various leucocytes in the horse, ox and dog at different altitudes, beginning at sea level and ascending to 10,000 feet above. The smears have been furnished by different practitioners who are considered reliable, and all smears are supposed to be from healthy animals.

The observation numbers in this article are carried through consecutively for convenience of reference. The table shown on the following pages gives the results thus far obtained.

It will be noted that in some cases the proportion is somewhat different from the balance of the group. It will be remembered that while it is presumed the animals are free from disease, yet an occult condition as abscess, etc., may be present and thus make individual differential counts. It will be noted that in these ninety-three observations no great constant variance is noted, and that the average percentage is close to that of other observers. What part, if any, altitude may play in the fluids of the body yet remains to be worked out.

Phagocytes are attracted by certain chemical substances—a phenomenon noted in acute inflammation. When a chemical substance attracts the leucocytes, we call the condition positive chemotaxis. When a chemical substance repels the leucocytes, we call it negative chemotaxis. When a leucocyte comes in contact with a hard inert foreign substance, there is noted a protoplasmic prolongation from the cell cytoplasm on either side and finally surrounding the particle. In acute inflammation due to the invasion of pus producing micro-organisms, and until the abscess is opened or suppuration has ceased, there is noted a leucocytosis. This increase is largely due to the variety that phagocytes that particular micro-organism producing the disease.

It has been only a short time since the existence of defensive fluids in the body has been definitely proven. Much knowledge has been gained by carefully conducted experiments in this and other countries, and while much is known about the existence and production of these fluids which aid phagocytosis, yet

Name.	Location.	Altitude.	Animal.	Observation No.	Poly-morphs.	Lym-	phos.	Monos.	Eosins.	Mast.	Remarks.
Rinker.....	Galveston.....	Sea Level.....	Horse	1	51	.46	2.5	.75	1.5	Geld.	
Rinker.....	Galveston.....	Sea Level.....	Horse	2	54	43	3	7	.5	Mare.	
Rinker.....	Galveston.....	Sea Level.....	Horse	3	54	42	4	6	1	Mare.	
Rinker.....	Galveston.....	Sea Level.....	Horse	4	64	32	2	8	1	Mare.	
Rinker.....	Galveston.....	Sea Level.....	Horse	5	55	42	3	14	1	Pony.	
Rinker.....	Galveston.....	Sea Level.....	Horse	6	54	41	5	12	1	Pony.	
Rinker.....	Galveston.....	Sea Level.....	Horse	7	53	44	3	6	1	Geld.	
Rinker.....	Galveston.....	Sea Level.....	Horse	8	47	46	7	5	...	Mare.	
Rinker.....	Galveston.....	Sea Level.....	Horse	9	55	42	3	16	3	Pony.	
Average.....				54.1	42	3.5	—	—	—	—	—
Rinker.....	Galveston.....	Sea Level.....	Cow	10	28	70	2	14	3	...	
Rinker.....	Galveston.....	Sea Level.....	Cow	11	27	71	2	4	2	...	
Rinker.....	Galveston.....	Sea Level.....	Cow	12	26	73	1	1	5	...	
Rinker.....	Galveston.....	Sea Level.....	Cow	13	34	61	5	7	2	...	
Rinker.....	Galveston.....	Sea Level.....	Cow	14	27	71	2	6	1	...	
Rinker.....	Galveston.....	Sea Level.....	Cow	15	20	78	2	11	...	...
Average.....				27	70.6	2.9	—	—	—	—	—
Rinker.....	Galveston.....	Sea Level.....	Dog	16	60	29	2	...	...	Terrier.
Rinker.....	Galveston.....	Sea Level.....	Dog	17	68	27	5	...	...	Terrier.
Rinker.....	Galveston.....	Sea Level.....	Dog	18	70	25	5	...	...	Terrier.
Rinker.....	Galveston.....	Sea Level.....	Dog	19	57	40	3	6	1	Cur.	
Rinker.....	Galveston.....	Sea Level.....	Dog	20	77	18	5	1	2	St. Bern.	
Average.....				68.2	27.8	4	—	—	—	—	—

Name.	Location.	Altitude.	Animal.	Observation No.	Poly-	Lym-	Polys. phos.	Monos.	Eosins.	Mast.	Remarks.
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	21	29	4	3	1	Geld. 9y.		
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	22	57	42	2	2	Geld. 8y.		
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	23	75	21	4	8	Mre. 14y.	2	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	24	45	53	2	5	Geld. 8y.	1	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	25	70	28	2	5	Geld. 16y.	2	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	26	55	42	3	6	Geld. 7y.		
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	27	70	26	4	8	Geld. 16y.	1	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	28	76	20	4	...	Geld. 12y.		
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	29	61	37	2	4	Geld. 12y.	1	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Horse	30	61	36	3	5	Geld. 12y.	2	
Average.				63.7	33.4	2.9	4.6	1			
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	31	36	60	4	9	Dur. 5y.	2	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	32	34	64	2	3	Dur. 5y.	3	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	33	37	62	1	6	Dur. 5y.	...	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	34	33	64	3	7	Dur. 6y.	4	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	35	32	64	4	9	R&W 4y.	...	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	36	45	53	2	3	Red 5y.	...	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	37	43	55	2	7	Red 5y.	1	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	38	34	65	1	6	Dur. 6y.	2	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	39	39	60	1	9	Dur. 5y.	2	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Cow	40	42	54	4	13	Dur. 5y.	1	
Average.				37.5	60.1	2.4	7.2	1.2			
Hall & Morrison.	Omaha.....	1,200 Feet.....	Dog	41	69	28	3	...	Terrier.	...	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Dog	42	81	17	2	...	Terrier.	...	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Dog	43	75	20	5	...	Pitt. bull.	...	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Dog	44	70	28	2	1	Bird dog.	...	
Hall & Morrison.	Omaha.....	1,200 Feet.....	Dog	45	70	27	3	...	Coach.	...	
Average.				73	24	3		.2			

Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	Geld. 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	Geld. 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	I Blk. 14y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	Bay 7y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	Gray 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	Bay 9y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	Bay 14y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Horse.....	Bay 15y.
Average.....				.5
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	Geld. 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	Geld. 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	I Blk. 14y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	Bay 7y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	Gray 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	Bay 9y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	Bay 14y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Cow.....	Bay 15y.
Average.....				.5
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	Geld. 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	Geld. 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	I Blk. 14y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	Bay 7y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	Gray 8y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	Bay 9y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	Bay 14y.
Kaupp.....	Ft. Collins.....	5,000 Feet.....	Dog.....	Bay 15y.
Average.....				.5
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	Geld. 8y.
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	Geld. 8y.
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	I Blk. 14y.
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	Bay 7y.
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	Gray 8y.
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	Bay 9y.
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	Bay 14y.
Kaupp.....	Raton.....	6,800 Feet.....	Horse.....	Bay 15y.
Average.....				.5
Brown.....	Brown.....			Mare. Geld.
Brown.....	Brown.....			Geld. ...
Average.....				4.5

Name.	Location.	Altitude.	Animal.	Observation No.	Poly-	Lym-	Monos.	Eosins.	Mast.	Remarks.
					morphs.	phos.	Monos.			
Brown.....	Raton.....	6,800 Feet.....	Cow	71	37	60	3	...	...
Brown.....	Raton.....	6,800 Feet.....	Cow	72	34	61	5	1	...	
Average.....					35.5	60.5	4	.5		
Brown.....	Raton.....	6,800 Feet.....	Dog	73	65	30	5	3	...	
Brown.....	Raton.....	6,800 Feet.....	Dog	74	63	34	3	2	...	
Brown.....	Raton.....	6,800 Feet.....	Dog	75	52	44	4	2	1	
Brown.....	Raton.....	6,800 Feet.....	Dog	76	64	35	1	1	3	
Average.....					61	35.5	3.5	2	1	
Kaupp.....	Colo. Springs.....	7,000 Feet.....	Horse	77	60	36	4	2	...	
Balmer.....	Leadville.....	10,100 Feet.....	Horse	78	61	33	6	4	...	Geld. 8 y.
Balmer.....	Leadville.....	10,100 Feet.....	Horse	79	57	39	4	5	1	Geld. 13 y.
Balmer.....	Leadville.....	10,100 Feet.....	Horse	80	65	31	4	7	...	Draft.
Balmer.....	Leadville.....	10,100 Feet.....	Horse	81	71	29	1	11	...	Geld. 8 y.
Balmer.....	Leadville.....	10,100 Feet.....	Horse	82	71	27	2	2	...	Geld. 14 y.
Balmer.....	Leadville.....	10,100 Feet.....	Horse	83	57	39	4	5	2	Mare 4 y.
Balmer.....	Leadville.....	10,100 Feet.....	Horse	84	52	43	5	9	2	Mare 7 y.
Balmer.....	Leadville.....	10,100 Feet.....	Horse	85	52	46	2	4	...	Mare 4 y.
Average.....					60.7	35.8	3.5	5.8	.6	
Balmer.....	Leadville.....	10,100 Feet.....	Cow	86	43	54	3	...	...	Hlst. 5 y.
Balmer.....	Leadville.....	10,100 Feet.....	Cow	87	44	53	3	2	...	Shrthrtn.
Balmer.....	Leadville.....	10,100 Feet.....	Cow	88	42	53	3	2	1	R&W 6 y.
Balmer.....	Leadville.....	10,100 Feet.....	Cow	89	41	54	5	1	...	Hlst. 3 y.
Balmer.....	Leadville.....	10,100 Feet.....	Cow	90	37	62	3	2	...	Shrthrtn.
Balmer.....	Leadville.....	10,100 Feet.....	Cow	91	37	41	2	3	2	R&W 7 y.
Balmer.....	Leadville.....	10,100 Feet.....	Cow	92	41	58	1	5	2	Roan 5 y.
Balmer.....	Leadville.....	10,100 Feet.....	Cow	93	50	48	2	1	...	R&W 4 y.
Average.....					44.3	52.8	2.7	2	.6	

*there remains much to be discovered, and our knowledge after all is only in its infancy.

Our English confrères have the honor of demonstrating and naming the chemic substance which may exist in the fluids of the body and which sensitizes the germs to the leucocytes, so that they are enabled to destroy much larger numbers. This substance they gave the name of opsonin from the word's meaning—I prepare for food.

Opsonins are of a colloidal nature as proven by the filtration of serum through a sterile Chamberlain filter under high pressure. Yorke found that while the opsonin passed through at first, as soon as the pores became filled with the proteids of the serum, no more passed through. Bispan proved that opsonin was not dializable, and further that it was carried down with euglobin when the serum is half saturated with sulfate of ammonia.

Serum dried at 23° C. still contains the opsonin in an active state. Noguchi has shown that the opsonin thus preserved is still active after two years. Thus desiccated it resists a dry heat of 120° C., but will be destroyed if the serum containing it is heated to 60 to 65° C.

According to the results of experiments, opsonin is probably not formed in the blood. Allen's experiments go to indicate that at least one place of its formation is in the musculature.

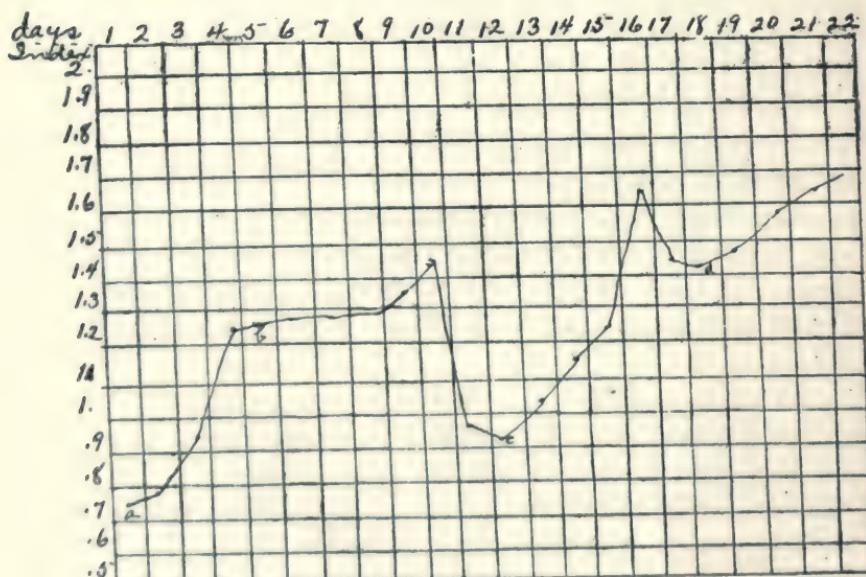
Experiments have shown that pus contains little or no opsonin. The opsonin content of serous exudates in pathological conditions, as in pericarditis, pleuritis, meningitis, peritonitis, etc., may greatly decrease. Such fluids should always be removed from the body.

Bacterial vaccines have been proven to so stimulate the increased production of opsonin that they are valuable in treating many diseases especially suppurating conditions as poll evil, fistula, quittor, wound infections, local septic infections, infected and suppurating nail pricks all are benefited by the introduction into the body of the vaccine made from the germs causing the disease. There are also many other conditions as strangles in horses that yield to the introduction of a vaccine made from the

specific germs. In this laboratory there has been prepared vaccines which have been used successfully in the hospital practice, and has been sent out to practitioners in large quantities. In order to arrive at a definite dosage of the vaccine used in conditions accompanied by pus formation, a series of opsonic determinations have been made, at the same time noting the clinical signs that go with the proper dosage as indicated by the opsonic index. The minimum dosage for satisfactory results have been aimed at.

The first case was a bay mare 9 years old. Fistula of the withers one month standing. Operated on June 4th and again on the 6th. Ligamentum nuchæ was necrosed, and diseased area was dissected out. Drainage was established. The following chart will give the reader an understanding as to the opsonic curve as influenced by the vaccine and also as to its lasting effect:

OBSERVATION NO. 94—CHART NO. 1.

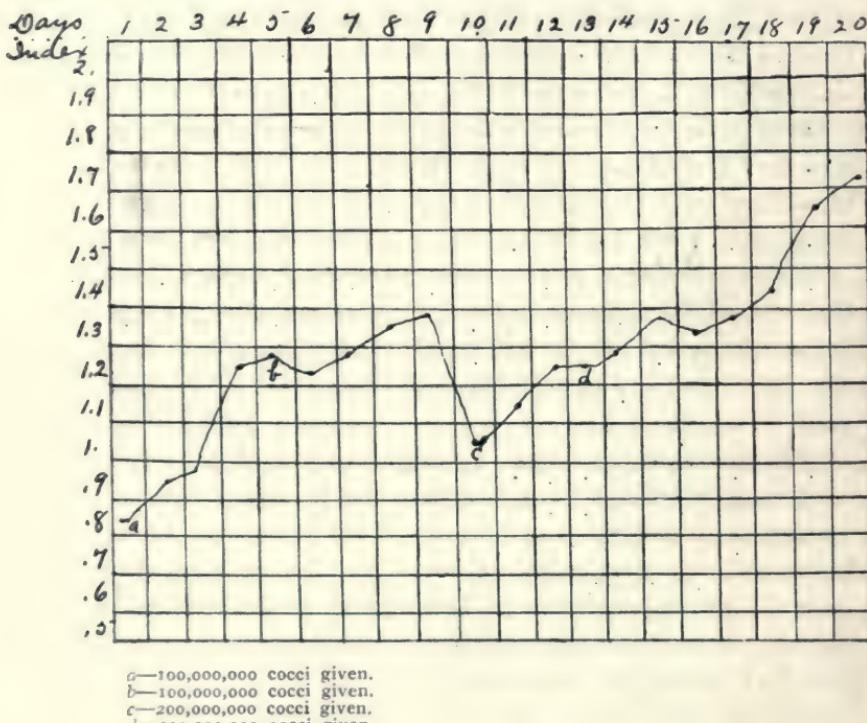


a—100,000,000 cocci given.
 b—100,000,000 cocci given.
 c—200,000,000 cocci given.
 d—300,000,000 cocci given.

The vaccine was made from the *staphylococcus pyogenes aureus*, *staphylococcus pyogenes albus* and *streptococcus pyogenes*. It contained equal parts of each. After the first injection the swelling at the end of the fifth hour was three inches in diameter. The opsonic index was the same as when the injection was given, showing no negative phase at that time. On this quantity it will be noted that the index gradually increased for three days when the index the following day was found to be practically the same, and another injection was given. Following this second injection an opsonic determination was made at the end of the seventh hour, but no negative phase was observed; on the other hand it was practically stationary. The swelling at the point of injection was only one and one-half inches in diameter, which receded as the former swelling in about seventy-two hours. This small swelling indicated that the injection was not large enough as a second vaccination. The index will be noted to have remained practically stationary for the following three days, then a slight upward turn. This quantity of vaccine, however, did not allow of the index taking a downward curve till after the fifth day. Another day was allowed to pass to see just what would take place and a further fall was noted. At this time the dosage was doubled. The swelling at the end of the seventh hour was about two and a half inches in diameter, which subsided in about seventy-two hours. The pus had been gradually becoming less in quantity. The pus thick and creamy and the wound gradually becoming dry. It will be noted as indicated by the chart that the index took a brisk upward turn as a result of this increased dosage. This continued increase in the production of opsonin as indicated by the index lasted for four days. A drop then took place and another injection of vaccine was given and another rise followed.

The second case was a bay gelding 9 years old. Fistula on the right side. The abscess was opened and good drainage established. As noted by the chart the opsonic index was .8 One hundred million germs in the form of a vaccine was injected subcutaneously. Seven hours after the vaccination the swelling at

OBSERVATION NO. 95—CHART NO. 2.



the point of injection was about two inches in diameter. This swelling subsided in less than 72 hours. At this time (7 hours) there was a slight negative phase. At the end of twenty-four hours the index had risen one-tenth of one point. The index continued to rise until the end of the fourth day. The pus became a trifle less in quantity, some thicker, but not so marked as in case No. 1. Another injection was given and an increased rise was the result. At the end of four days there was a sharp drop at which time another injection was made. This injection was followed by a slight negative phase, which was markedly overcome by the following day. The swelling at the point of injection was not so large as in the one previous, and it was decided to give a larger dose the next time. The swelling at the withers had gradually subsided as well as the pus less copious,

and the wound was becoming dry. Following a double dose, the index took another upward turn, and at the end of the third day a still greater dosage caused a continued increase of the production of the opsonin.

The conclusion of a careful study of these charts tell us that the minimum dosage of this vaccine to obtain the best results, should be at least 100,000,000 germs, and that this dosage must be gradually increased. That the swelling at the point of injection should be from two to three inches in diameter which should subside in from forty-eight to seventy-two hours. That the pus should become less in quantity and thick and creamy. While some good results have been obtained by no surgical interference, yet it is better to dissect out all necrotic tissue and establish good drainage. Where the wound is large and around the cartilage of prolongation and free motion of the scapula upon the wound, and the animal runs in a large field, little results can be looked for or the results will be very slow. Likewise a large pus pocket undrained will not yield till good drainage is established. We have also noted that some cases will respond much more satisfactorily than others but all are benefited if the right germs are used in the preparation of the vaccine. The germs must be virulent.

It is observed by those who do blood study on the human patient that certain anæsthetics cause a destruction of erythrocytes, and a lowering of the hemoglobin of the blood. It is noted that those fat dissolving agents as ether and chloroform, particularly have this effect and in experiments conducted in this laboratory ether has proven the most destructive to this part of the blood.

The difference in clinical results may be explained by the variation in technique of the administration, in volume of anæsthetic used and the duration of anæsthesia.

With ether anæsthesia the hemoglobin content gradually falls as do the number of erythrocytes. The restoration of the hemoglobin is less rapid than that of the erythrocytes. Therefore ether is not advisable when the hemoglobin content is low. A leuco-

cytosis may follow etherization. If there is a long post leucocytosis (longer than twenty-four hours), it indicates, in surgical cases, poor drainage, unopened pus pockets or secondary infection.

Anæsthesia by chloroform may likewise be followed by leucocytosis. The degree and length of this leucocytosis depends upon the rate of elimination of the chloroform from the body. It also reduces coagulability of the blood. Thus there is a greater danger of oozing in cases of surgical operations. The changing of a packing in a wound may be followed by a temporary leucocytosis.

It was determined to conduct some experiments to see what effect if any anæsthesia had on the power of leucocytosis, and to determine if the effect was upon the opsonin, or upon the physical power of the cytoplasm. All the literature at hand was searched for like experiments and one series was found. This series consisted of three experiments conducted by Dr. L. Reynolds, an Englishman. The experiments were conducted upon two dogs and one guinea pig. Anæsthesia was produced by morphine. In each case the power of phagocytosis of the blood was reduced 50 per cent. or more. No effort was apparently made to determine just what element the anæsthetic had its effect upon.

The table on the following page shows the quantitative as well as the relative cellular blood count.

These observations indicate that the anæsthetics have the effect of temporarily reducing the phagocytic power of the blood. That as a rule this condition lasts less than twenty-four hours.

The next series of experiments were conducted in an effort to determine, if possible, whether the effect was upon the opsonin or upon the physical properties of the cytoplasm of the cell.

In this study 1a = leucocytes before anæsthesia.

1b = plasma before anæsthesia.

2a = leucocytes after the animal had been
under the anæsthetic one hour.

2b = plasma after the animal had been under
the anæsthetic one hour.

3a = streptococcus pyogenes emulsion.

Animal.	Anesthetic.	Time.	Erythrocytes.	Poly-morpho-nuclears.	Lymphocytes.	Monocytes.	Mast. cells.	Remarks.
Dog.....	H. M. C.....	Before anaesthesia	OBSERVATION No. 96.	74	16	10	..	Blood secured while animal under anaesthesia.
Dog.....	H. M. C.....	1 hr. under anaesthesia.	6,100,000 16,000	79	16	5..	..	
Dog.....	H. M. C.....	24 hrs. later.....	6,300,000 17,000	81	16	8..	..	
Dog.....	Phagocytosis before anaesthesia, 7.6 cocci per polymorph.		7,120,000 17,000					
Dog.....	Phagocytosis under anaesthesia, 1 hour, 3.4 cocci per polymorph.							
Dog.....	Phagocytosis 24 hours after anaesthesia, 7.5 cocci per polymorph.							
Dog.....	H. M. C.....	Before anaesthesia	OBSERVATION No. 97.	76	20	4..	..	
Dog.....	H. M. C.....	1 hr. under anaesthesia.	3,800,000 7,000	83	15	2..	..	
Dog.....	H. M. C.....	24 hrs. later.....	4,200,000 11,000	80	14	6..	1..	
Dog.....	Phagocytosis before anaesthesia, 7.7 cocci per polymorph.		5,000,000 12,000					
Dog.....	Phagocytosis 1 hour under anaesthesia, 3.2 cocci per polymorph.							
Dog.....	Phagocytosis 24 hours after anaesthesia, 6.1 cocci per polymorph.							
Dog.....	Ether.....	Before anaesthesia	OBSERVATION No. 98.	59	33	8..	1..	
Dog.....	Ether.....	1 hr. under anaesthesia.	5,520,000 18,000	61	33	6..	..	
Dog.....	Ether.....	24 hrs. later.....	3,800,000 21,000	65	27	8..	1..	
Dog.....	Phagocytosis before anaesthesia, 4.1 cocci per polymorph.		4,680,000 22,000					
Dog.....	Phagocytosis 1 hour under anaesthesia, 2.5 cocci per polymorph.							
Dog.....	Phagocytosis 24 hours after anaesthesia, 3.5 cocci per polymorph.							
Dog.....	Ether.....	Before anaesthesia	OBSERVATION No. 99.	67	31	2..	..	
Dog.....	Ether.....	1 hr. under anaesthesia.	4,900,000 12,000	64	30	6..	..	
Dog.....	Ether.....	24 hrs. later.....	3,800,000 10,000	63	33	4..	2..	
Dog.....	Phagocytosis before anaesthesia, 4.3 cocci per polymorph.		4,500,000 11,000					
Dog.....	Phagocytosis 1 hour under anaesthesia, 3.3 cocci per polymorph.							
Dog.....	Phagocytosis 24 hours later, 3.5 cocci per polymorph.							
Dog.....	Chloroform.....	Before anaesthesia	OBSERVATION No. 100.	75	24	1..	3..	
Dog.....	Chloroform.....	1 hr. under anaesthesia.	4,720,000 10,000	76	22	2..	..	
Dog.....	Chloroform.....	24 hrs. later.....	3,700,000 9,000	71	26	3..	2..	
Dog.....	Phagocytosis before anaesthesia, 4.7 cocci per polymorph.		4,660,000 12,000					
Dog.....	Phagocytosis 1 hour under anaesthesia, 3.2 cocci per polymorph.							
Dog.....	Phagocytosis 24 hours later, 3.6 cocci per polymorph.							
Dog.....	Chloroform.....	Before anaesthesia	OBSERVATION No. 101.	67	32	1..	..	
Dog.....	Chloroform.....	1 hr. under anaesthesia.	5,400,000 12,000	68	30	2..	..	
Dog.....	Chloroform.....	24 hrs. later.....	3,450,000 14,000	65	33	2..	..	
Dog.....	Phagocytosis before anaesthesia, 3.1 cocci per polymorph.		5,300,000 13,000					
Dog.....	Phagocytosis 1 hour under anaesthesia, 1.8 cocci per polymorph.							
Dog.....	Phagocytosis 24 hours later, 2.9 cocci per polymorph.							

Blood was secured, centrifuged, and the plasma placed in capillary tubes. The leucocytes washed and likewise kept. The dog was then chloroformed one hour, and while the animal was still anæsthetized, blood secured and likewise handled. After the usual technique the following problems were run:

Observation No. 102.

- 1—1a + 2b + 3a = 6 cocci per cell.
2—1a + 1b + 3a = 9 cocci per cell.
3—2a + 1b + 3a = 7.7 cocci per cell.

Observation No. 103.

- 1—1a + 2b + 3a = 2.5 cocci per cell.
2—1a + 1b + 3a = 4.2 cocci per cell.
3—2a + 1b + 3a = 4.2 cocci per cell.

Observation No. 104.

- 1—1a + 2b + 3a = 2.7 cocci per cell.
2—1a + 1b + 3a = 3.5 cocci per cell.
3—2a + 1b + 3a = 3.3 cocci per cell.

In these three problems we note that the leucocytes before anæsthesia plus the plasma after the animal was under the anæsthetic one hour showed a lower number of cocci per cell than did the leucocytes after the animal had been under the anæsthetic one hour plus the plasma before anæsthesia. As a check on this result we have for comparison the leucocytes plus the plasma before anæsthesia which show a similar result, indicating that chloroform exerts its greatest influence upon the opsonin, or its production.

A detailed description of the technique in this work has been purposely omitted, as the length of the article would not permit it, and every laboratory worker is perfectly familiar with it.

NINETY-FOUR California veterinarians were in attendance at the San Francisco meeting of the A. V. M. A., and three medical men of that state honored the association by their presence.

BOVINE TUBERCULOSIS LEGISLATION.*

BY M. H. REYNOLDS, UNIVERSITY OF MINNESOTA AND STATE LIVE STOCK SANITARY BOARD.

There are some phases of the bovine tuberculosis problem which your International Commission did not think best to consider and report upon although conceding their importance. One of these was the question of state live stock sanitary organization and legislation in the United States.

It is my purpose to present this phase of the problem and call the attention of this Association to certain difficulties and urgent needs and make some recommendations.

A study of the law, organization and work now being done by the several states of the Union reveals some startling information. Twenty-five states impose tuberculin test restrictions on importation; sixteen states have some provision for compensation; fourteen states provide for testing by the state, *i. e.*, the state *may* test; seventeen states of the Union have provision for compulsory reporting; only five states have any provision for carcass salvage; but two states have legal provisions for pasteurization of creamery skimmed milk, although this is a most serious source of dissemination; one has state meat inspection service; two, possibly three, are attempting to control the distribution and use of tuberculin; seventeen states have no special provisions referring to tuberculosis, and twenty-one states of the Union are not even pretending to do anything with the great problem of bovine tuberculosis. It should be understood that these figures are probably not exactly correct, but are as nearly correct as we are able to get from state laws available and are sufficiently accurate for our present purpose. In many states laws are so

* Presented in connection with report of committee on diseases. A. V. M. A., September, 1910.

worded that it is exceedingly difficult to estimate what they do really provide.

Let us consider some of these statements more carefully.

Twenty-five states out of a total of about fifty have legal provision for tuberculin test of dairy cattle and breeding cattle imported, but very few of these are making any attempt to control tuberculosis among their own cattle. Seventeen states ignore tuberculosis in their state laws. Only seventeen states, about one-third, have any form of compulsory reporting. Five states provide for carcass salvage with sixteen states providing compensation for owners. Only two states have provision, so far as I am able to learn, for pasteurization of their creamery skimmed milk. Sixteen states are providing for compensation to owners with but one state having any provision for meat inspection service. About two states, possibly three, out of a total of about fifty, are attempting to control the sale and distribution of tuberculin although it is usually conceded among students of the bovine tuberculosis problem that this is of fundamental importance.

These figures and statements are startling to those who have been studying the situation—possibly not quite so significant to those who have not been deeply interested. One state of the Union and one of the oldest states, has made no change in its live stock sanitary law since tuberculin as a diagnostic, was discovered. My listing in most of these classifications has been very generous and the statements are probably conservative rather than extravagant. Note that in this showing our states are long on provisions like importation regulations which cost nothing and as hitherto managed accomplish little, and very short on provisions like those relating to sale on test of pure-bred cattle, pasteurization of creamery skim milk, control of tuberculin, and state meat inspection—which might occasion expense or antagonism.

Think of it, twenty-one states doing absolutely nothing and making no pretense, with very many other states practically ignoring the state legislation which they have.

Is it not painfully evident that our work in this country as in other countries, has been scattered and irregular, small and ineffective? Is it not painfully evident that it has been unsystematic; that we have not been getting anywhere except as to progress in public education; not getting anywhere so far as control work is concerned, and that little permanent work has been accomplished in the way of eradication? I believe that the condition of public interest and education is such that we are ready for something definite and practical. Two things seem to be absolutely essential and hitherto lacking:

First, efficient organization, and, second, a practical policy.

ORGANIZATION.

It must be granted that the present situation in the United States is unsatisfactory. A few states have good live stock sanitary organization, but these few are widely scattered. Many states have weak and inefficient political organizations that amount to little so far as sanitary work is concerned. Many states have practically nothing in the way of a sanitary machine, and are doing practically nothing. I can put my finger on the map of the United States at plenty of places where the state live stock sanitary organization as an agent for hog cholera control work or tuberculosis control work is simply a joke. Yet these same states have heavy interests in cattle and hogs and plenty of tuberculosis.

It is evident that thorough and well-planned organization is necessary for effective work with such a difficult and complicated, such an immense problem as tuberculosis.

It does not require great foresight to predict safely that there is rough sailing ahead for any board that undertakes to do real work with tuberculosis. Opposition must be expected from politicians, from breeders, and even from powerful breeders' organizations. To meet this opposition, the state live stock sanitary organization must have a firm and permanent foundation and the strongest possible backing. It must have permancy or it can not

accomplish results. There should be close and friendly relation with agricultural colleges and experiment stations, with breeders' associations and state veterinary associations. Such an organization must be able to formulate very long-time plans with a reasonable probability of being able to carry them out. Let me suggest a proposition for your careful consideration. It is this:

The most perfect plan that could possibly be devised for tuberculosis control work is necessarily foredoomed to failure if it does not provide for an efficient organization of the body that assumes the task. Of what possible use could or can an ideal plan be without an efficient sanitary machine to carry it out? These are certain fundamentals of legislation which are of universal application.

FUNDAMENTALS OF LEGISLATION.

Uniformity of law and regulation.—That there is urgent need of uniformity among several states attempting to do police work with bovine tuberculosis as well as between adjoining nations, is self-evident. In the United States at least, where the writer is better acquainted, our breeders and shippers are constantly being put to serious embarrassment by reason of the present confusion of state laws and regulations on this question. The writer recently had a letter from a prominent Iowa breeder who was trying to ship a registered bull to another state. He certainly had an annoying time of it, although trying in the best of faith to comply with requirements. Uniformity of laws and regulations between neighboring states would contribute very greatly to efficiency of sanitary service. Let us aim toward uniformity.

There are certain fundamentals that must be provided for in laws or regulations. There are certain principles that are equally applicable in California and Minnesota.

It is self-evident that there must be a well-organized executive body.

This machine for doing the work must be authoritative; it must have assurance of permanence. It must have ample backing

and public confidence and must represent fairly all interests, especially live stock and veterinary.

The plain purpose of this machine and its responsibility is to protect public health from diseases of animals and to protect animal husbandry from losses through infectious diseases of domestic animals. This central executive or controlling body should have for its chief function, police sanitary control work. It should not strive to be an experiment station. The government and the several states have an organization especially provided for experimental work. If the experiment stations are inefficient and are not doing the work which they ought to do then they should re-organize and be strengthened. There should not be an experiment station and a live stock sanitary board in the same state trying to do the same work at the same time. The scope of authority for the executive body must be ample. It should have almost unlimited authority so far as proper sanitary control work is concerned and at the same time be so organized that it can be safely trusted for judgment and intelligent administration.

LEGISLATION WITH ESPECIAL REFERENCE TO TUBERCULOSIS.

I will group fundamentals under: Location of Tuberculosis; Dealing with Tubercular Herds; Avoidance of Dissemination, and Financial Considerations.

Location.

It is self-evident that in any legislation pretending to deal with the problem of bovine tuberculosis, means must be provided for locating diseased animals and authority be given to the executive body to deal properly with it when located. First of all, there must be some accurate diagnostic officially recognized; an accurate diagnostic is absolutely necessary to any effective work. An executive body representing the state should be able to test for owners under proper restrictions.

There should be provided some compulsory notification, but there may be reasonable question as to whom this compulsion should rest upon. I believe, and I have had some years of experience to justify the belief, that a good law should provide that anybody who knows of or has reason to suspect the existence of infectious disease is under moral and should be under legal obligation to make proper report.

Then we should have the information available from killing floors. This means that proper provision should be made for tracing back to the herds from which the diseased animals come, and the state authorities must be able to act upon this information.

Under location we have also official tuberculin testing. Tuberculosis found in the course of such testing—tuberculosis of even a few animals must place the entire herd under official supervision. There is no other tenable ground.

Tuberculin supplies us with the accurate diagnostic which has been already referred to as fundamentally necessary. Within recent years it has become evident that the state must have supervision over the distribution and use of tuberculin. There should be made provision for reliable reports of sales, and tuberculin test work that has any official bearing should be accompanied by an affidavit from the owner specifying clearly concerning the last previous test or injection.

Careful provision must be made for dealing with the tubercular herd.

Dealing with the Tubercular Herd.

In this work we must have public confidence, and owners in general must realize that they are having fair treatment. This is not only wise as a matter of policy, but it is right. The owner should have full and generous protection, whether tuberculosis is found on the killing floor or whether tuberculosis is not so found. Conditions are rare under which the owner should not be given an option between quarantine and slaughter.

I believe firmly that compensation is wise and helpful, almost necessary in many states for rapid progress *in the early history* of this work, and on the other hand I am equally certain that this should be regarded as a temporary procedure and provision should be made for doing away with compensation as soon as the state is ready for permanent work on a large scale. The writer is thoroughly convinced, after some years of experience, that compensation is not wise for any state when that state attempts real control or actual eradication in earnest.

Carcass salvage is not only practical and wise but abundantly justified by experience, and states which are making no attempt at carcass salvage are doing extravagant work. I say this realizing that there are quite a number of states not provided with abattoirs having Federal inspection, and that Federal laws prohibit interstate shipment of tubercular cattle. Killing many tubercular cattle without carcass salvage is extravagant work.

The disposition of tubercular cattle needs to be varied according to several conditions. The executive body should have ample authority to deal with a diseased herd according to extent of infection, number and value of animals and accessibility to abattoirs. A herd of common grade cattle of relatively low value can not usually be dealt with according to exactly the same procedure as the high bred herd of valuable animals. Two herds of the same class, one containing a very low percentage of tuberculosis and the other a very high percentage of tuberculosis can not always be dealt with wisely by the same procedure.

A final suggestion under this head is that non-reactors in a tubercular herd must themselves be considered suspicious.

Avoidance of Dissemination.

Avoidance of dissemination is perhaps the great fundamental. There is much food for thought in the suggestion often made by Dr. V. A. Moore, namely, that eradication would be accomplished naturally with the death of the present generation of cattle if further dissemination were not permitted. It is self-

evident that all contact between healthy and diseased animals must be avoided. Even contact in open air has in recent years been repeatedly shown an important consideration, and unsafe.

Creamery skimmed milk furnishes in many states one of the most serious sources of dissemination. Fifty farmers take their milk to a certain creamery. The great majority of them may have sound herds. A few have tubercular herds. The skimmed milk is all mixed in large tanks. Each owner takes home his share of mixed milk and some tuberculosis for his calves and hogs. The remedy is simple and obvious; state legislation providing for efficient pasteurization. In this legislation specific provision should be made for time and temperature of exposure or pasteurization becomes a farce.

The sale and exchange of breeding cattle has probably done more to take tuberculosis in previously free areas at a distance than any other agency. Here we have the obvious suggestion for importation regulation, and legislation providing for sale or exchange with certificate of tuberculin test for intra-state movement. We have a comparatively new law in Minnesota providing for such tuberculin test of pure bred cattle sold and we have been most agreeably surprised by the lack of opposition and lack of friction as it has gone into effect.

It is an accepted principle that all importation of dairy and breeding cattle into states which are attempting to do anything with tuberculosis at home, should be subject to satisfactory certificate of tuberculin test. States that do not have such provision must necessarily become dumping ground for neighboring states which do have importation restrictions. We have some of the richest stock states in the Union becoming conspicuous as dumping grounds for tubercular cattle. What a slaughter is looming up there for the future!

It has become painfully apparent in recent years that the only satisfactory certificate of tuberculin test for importation is one signed by a Federal or responsible state official, or at the very least, by an accredited private practitioner and countersigned by a state official representing the executive body.

Finally under the head of avoidance of dissemination and particularly with reference to importation, there must be cordial state and Federal co-operation at terminal points, and provision should be made for this in state legislation. I must call attention to financial considerations.

Financial Consideration.

Any really effective tuberculosis control work must have generous financial support and it is decidedly preferable that this should be in the form of a fixed annual appropriation instead of special appropriations from time to time as the legislature meets. The executive sanitary body must be able to work on plans extending far into the future. It is important that the executive body may know as far as possible in advance what it can depend upon in the way of funds. It can not get results when generously provided during one bi-ennial period and badly cramped in the next. No great work can be accomplished on such a basis.

The justification for generous funds lies in the fact that tuberculosis among domestic animals is conspicuously a public welfare problem. We must not lose sight of the fact that the prosperity of a people must ordinarily depend upon the prosperity of their agriculture and it is equally clear that in America prosperous agriculture depends upon a prosperous animals husbandry. All lines of business, all commercial enterprises are financially concerned in tuberculosis control work.

Funds provided for this work must be used exclusively for their legitimate purpose and expended wisely and economically. While many legislatures seem willing to stand for unreasonable extravagance in certain lines, they will not stand for extravagance in any sanitary control work, either human or veterinary. The legitimate use of public funds provided for this work is first and always sanitary police control work.

It goes without saying that there must be a proper system of accounting and reporting on the part of the executive body responsible for the work.

Recommendations.

In Canada veterinary police work is centralized in the Dominion government and under one head which makes it a comparatively easy matter to put any policy into prompt operation. Canada can easily make immediate use of the recommendations of the International Commission on Bovine Tuberculosis. I am not at all clear as to just how much use many states of the Union, with their present organization and legislation, can make of these same recommendations.

It is scarcely worth while to spend the time of this Association discussing the question as to whether intra-state tuberculosis work should be done in the United States directly by the Federal government, or whether it is wiser and safer policy for this work to remain where it now is, each state being sovereign so far as its sanitary police work within the state is concerned. I say it is scarcely worth while for us to discuss this question at present because it is extremely probable that a great many states will not voluntarily surrender to the Federal government their sanitary police rights within any reasonable term of years. Whether it is wiser policy or not is not under discussion. Direct centralized Federal control might easily be infinitely more efficient, but the conspicuous fact is that with few exceptions individual states are going to continue doing their own intra-state work for many years to come.

With the unsatisfactory condition of our state organizations and our state legislation as already presented, it seems that Canada may very easily outstrip us in the near future so far as dealing with bovine tuberculosis is concerned. Our situation in the United States may be good relatively, comparing with some other nations; but actually it is very bad so far as future effective work is concerned. The sooner we admit this to ourselves and get busy trying to improve it, the farther along we will be twenty-five years from now. With our progress made and experience gained we might easily point the way for other nations to follow. But after all the important thing is not that Canada

may make greater progress in the future than the United States, or that the United States may beat Canada or any other country, but that the individual states of the Union should, as rapidly as possible, get on a good basis for effective work in the control of tuberculosis among our domestic animals. With present organization and present legislation in very many states where live stock interests are heavy, effective work simply is impossible.

The United States Association of Live Stock Sanitary Boards has taken up this problem and has a committee already working upon it.

In closing we wish to recommend that this Association appoint a committee of three to confer with the Committee already appointed by the United States Association of Live Stock Sanitary Boards with a view to studying the problem of better state organization for control work.

Commenting upon this we may say that there can be no reasonable anticipation of sudden developments. Improvement must be gradual—possibly slow—but the present situation is extremely unpromising and even though it take us five years or twenty-five years to make any appreciable progress, it is a work that ought to be done. It should be begun soon as possible and then be pushed persistently and patiently.

THE dainty, artistic beauty of the cover of the A. V. M. A. program, with sprigs of California poppy, did not "just happen," but cost Dr. Archibald and some of his colleagues a good many hours of strenuous thinking; some of his associates predicting that he would get some gray hair over it before he would get it to finally satisfy him. No wonder the universal exclamation, "What a handsome thing that is!" unconsciously escaped the beholder when the eye fell upon it for the first time. The effect of the immaculate, white cover, the beautiful coloring of the poppies and the deep rich green of the lettering was very striking, and repaid the committee for the time and thought they gave to it.

SOME METHODS EMPLOYED IN NORTHERN EUROPE TO CONTROL BOVINE TUBERCULOSIS.*

BY VERANUS A. MOORE

In the summer of 1909, under the auspices of the New York State Department of Agriculture, I had an opportunity to study somewhat carefully the methods employed for the control of bovine tuberculosis in Denmark, England, Germany and Holland. The difficulties attending the control of this disease in Europe are not essentially different from those in this country. The methods or systems of control which have been adopted there differ, however, from those generally applied or considered with favor in America. The reason for the difference lies primarily in the views or beliefs of the people—both officials and laymen—relative to the application of recorded facts pertaining to the disease. It is also apparent that the Europeans recognize the situation in its entirety more fully than Americans, and consequently they are willing to submit to the most feasible methods which give constantly increasing security and which tend eventually to eradicate the disease.

The control of tuberculosis of cattle in Europe is looked upon more philosophically than it is in this country. It is recognized as a great scourge which became widespread before the significance of its existence was recognized. Because tuberculosis existed in a large percentage of herds, the question of control seems to have centered about some method by which sound herds could be built up from diseased ones with the least loss to the owners. This feeling has not permitted radical measures, nor has it carried the people away from the actual conditions as they exist. This has permitted the application of methods which their

* In connection with report of Committee on Diseases A. V. M. A., San Francisco, Sept., 1910.

authors believe will eventually eradicate the disease. These methods are characterized by their constantly increasing protection to the people who—contrary to American citizens—are willing to accept a steady improvement until the ideal is reached rather than to attempt, with great sacrifice, the impossible step from present conditions to the ideal at once.

Before discussing the methods that are being tried it is essential that the difference in the attitude of the people in Europe and America toward the tuberculous cow should be understood. In all of the methods the cases of open tuberculosis are considered dangerous and they are to be eliminated. On the other hand, clinically sound cattle which react to tuberculin are not in Europe considered dangerous to any great extent at least, and the owners of such cattle sell the milk in the open market, while in this country such an act would not be permitted. This makes the Bang and Ostertag methods possible in the old world, and the Manchester procedure does not take occult cases into account. Again, owners of tuberculin reacting cattle are allowed to dispose of them as they please, thereby being able to eliminate infected animals to the greatest possible advantage and to establish sound herds in the minimum time. The apparent reason for this is that a large percentage of the herds already contain one or more infected animals. The object to be attained is the establishment of sound individual herds.

The methods that are employed to eliminate bovine tuberculosis in the countries mentioned may be divided into two classes. The first, which may be called the direct method, consists in the government giving direct assistance to cattle owners to aid them in their efforts to eradicate tuberculosis from their herds. The second, which may be called the indirect method, consists in certain local regulations to protect the people of a community against the danger of tuberculous infection from milk, and thus indirectly interfering with the natural dissemination of the disease among cattle. The laws and regulations pertaining to the indirect method often differ one from another, and in many localities they do not exist at all. Their purpose is to protect

the public health, but indirectly, as already stated, they are believed to be of varying value in lessening the amount of tuberculosis in the dairy herds. In none of the countries mentioned does the law or the regulations now in force presume to control the disease in all of the herds in the country. The governments are concerned with the direct method only, and to prevent the importation of the disease.

DENMARK.—In Denmark the method known as the “Bang method,” in honor of Professor Bang who introduced it in 1894, is the direct and official procedure followed. It consists in the government testing with tuberculin all the cattle in a herd, when requested to do so by the owner, who agrees to comply with the government requirements. These consist in separating the reacting animals from the non-reacting ones, either by placing them in different stables or by putting up a partition in the same stable. When outside they are kept in separate paddocks or fields. The advanced cases and all cows with udder tuberculosis are eliminated. The non-reacting animals are tested every six months or a year, and if any of them give a reaction they are placed with the reactors. The calves of the infected cows are removed promptly after birth from their dams and fed the milk of the sound nurse cows or the pasteurized milk of the infected ones. As soon as the sound herd is of sufficient size, the reacting animals are eliminated and their stable thoroughly disinfected. As a precaution all of the separated milk at creameries is pasteurized at 80° C. before it is returned to the farm.

Since 1894 about 10 per cent. of the herds in Denmark have been brought under this method with very gratifying results. The other 90 per cent. remain without control except by the indirect method.

The success of the Bang method in the herds where it has been tried have been made possible because of two important conditions, viz.:

(1) The farmer is allowed to sell the milk of the reacting cows with that of the healthy ones, except where the local authorities object or where infants' or children's milk is produced.

(2) The owners are allowed to sell the reacting animals to whom and where they please. This freedom of action enables cattle owners to eliminate undesirable animals and to keep for breeding purposes the better ones.

As the milk is used and as the cattle can be sold, the method is carried out with little loss to the owner and with small cost to the state.

On the question of eliminating tuberculosis, Professor Bang states that by removing all of the udder and other clinical cases, the danger from the milk is minimized and, therefore, it is much safer than it was before the herd was tested. The sale of reacting cattle is not prohibited, because it would prevent farmers from eliminating the infected individuals from their herds. So long as a large percentage of the herds are infected, the Danish government sees no objection to this practice. In a country where tuberculosis is prevalent, Professor Bang himself stated that "It is no worse to sell a cow that reacts to tuberculin than it is to sell one that has not been tested." He would not approve of this practice if most of the herds were free or if the government assumed control of *all* herds and compensated the farmers for the reacting animals.

The Danish method requires from three to ten years to build up a sound herd from an infected one. The further and most important lesson to be taught by this process is that the owner himself becomes educated in the nature of the disease, so that thereafter he will keep his herd free. Such men will not purchase reacting animals. The dairymen are learning that it is necessary to raise their own cows or to buy them from *sound* herds.

I saw a number of herds both large and small where this method was being or had been carried out. It was quite as effective in the small as in the large herds. The Bang method is generally considered by cattle owners in Denmark to be entirely satisfactory, and if carefully applied to give the desired results. The increased profits accruing to those who have sound herds is tending to bring more and more farmers to apply the method.

If a farmer who applies for assistance refuses to comply with the government demands, the request is denied.

In Denmark the government gives compensation for cases of udder tuberculosis only. Professor Bang would like to have compensation given for cases of open tuberculosis of the lungs, intestines and uterus as well as of the udder.

GERMANY.—In Germany the method of separating the sound from the reacting animals as followed in Denmark is not looked upon with favor, largely because of the difficulty in separating the two classes. At present the law does not provide for compensation to the owners of cattle, although an act recently passed, and which will go into effect in about a year, provides for the condemnation with compensation for open cases of lung, intestine, uterine and udder tuberculosis. There are, however, in the different provinces local regulations, and some of these provide for a small compensation in certain cases.

The method which, for the time, is receiving most attention is that proposed by Dr. Ostertag. It consists in eliminating by slaughter all clinical cases of tuberculosis, removing the calves promptly after birth from their dams and keeping them separated for some months, after which they may be placed with the other cattle. During this early period the calves are to be fed on the milk of sound cows or on the pasteurized (heated to 85° C.) milk of the infected ones. It is considered somewhat safer to prolong the separation until a sound herd is built up. When cattle owners desire to do so, they have their herds tested with tuberculin, but as a rule they do not separate the reactors from the others. The herds are examined frequently by skilled veterinarians and all the animals that exhibit symptoms of tuberculosis are immediately eliminated either by sale or slaughter. In this way it is believed that the disease will be kept in check and eventually the infected animals will disappear. Ostertag thinks that tuberculosis can be eradicated by promptly removing the clinical cases with the simultaneous raising of young cattle free from infection. The Ostertag method is based on the theory that the clinical cases are so largely the spreaders of the virus that the few

occult cases which eliminate tubercle bacilli may be considered as a negligible quantity. In our country, the Ostertag method is generally considered the treatment of the entire existing herd as a tuberculous one, and the building up of a new and sound herd from the offspring.

ENGLAND.—In Great Britain there has been up to the present no direct official effort to control bovine tuberculosis. In many places the milk is more or less regularly examined for tubercle bacteria, and if they are found each of the animals in the herds from which the milk came is carefully examined physically, and the milk of all the cows that are found to be suspicious is examined bacteriologically. If tubercle bacilli are found, the animal is slaughtered at once or, more usually, fattened and killed under inspection for beef. Under the new regulations, tuberculin can be used with the consent of the owner or his agent, but not otherwise.

The procedure which is known as the Manchester method consists in taking milk from the dealers and examining it at regular intervals for tubercle bacteria. Professor Delapin's technique consists, in addition to such microscopic examinations as may be made, of the inoculation of small guinea pigs subcutaneously on the inside of the thigh with the sediment of centrifuged milk and killing them about twenty-one days later for examination. If tuberculosis is found the examination extends to the individual cows in the herd from which the infected milk came. Professor Rubert Boyce of Liverpool stated that by this method they had reduced the infected milk supply in that city to 6 per cent.

There is no restriction on the sale of reacting cows, and ordinarily the milk from the reactors and the non-reactors is mixed and sold, except where children's milk is being produced. The Bang method is being applied to some extent by private owners, but generally it does not seem to be favorably considered. There is no country where the feeling is stronger that bovine tuberculosis is of great sanitary significance than Great Britain. There seems to be no other where so little direct effort has been put forth to eliminate this disease from cattle. The general exam-

ination of the milk for tubercle bacteria has, however, done much indirectly to lessen the number of clinical cases of tuberculosis in the herds of the country.

HOLLAND.—In Holland by Royal decree the government gives facilities for the official inspection of cattle destined for exportation. Further, by a decree of the Queen any cattle owner can present animals to be examined by a government inspector if they are accompanied with a certificate from a veterinarian that the animal or animals are suffering from tuberculosis. If the diagnosis is tuberculosis the animals are slaughtered, and if they pass the inspection their carcasses are sold for food. If the government veterinarian is not sure of the diagnosis on physical examination he employs tuberculin. In all cases when the animals presented are found to be tuberculous, all of the cattle in the herds from which they came are inspected. If the veterinarian is in doubt regarding the diagnosis, the animals are tested with tuberculin. If tubercle bacteria are found in the mucus from the lungs or uterus or in the milk, the cow is killed.

At present cattle belonging to breeders only are killed and compensated for by the government.

Professor Poels thinks that tuberculosis of cattle must be combated slowly. He believes that the only way is to kill off the animals suffering with evident tuberculosis. Bang's method is not favored, in fact it was stated that it was impossible. Professor Poels also lays great emphasis upon physical examination as a means of detecting tuberculosis. He emphasizes the importance of greater skill in clinical examination. With Professor Bang he finds many cases of uterine tuberculosis and places much stress upon the bacteriological examination of uterine discharges.

Professor Poels, like Dr. Ostertag, believes that reacting cows in the absence of clinical symptoms rarely disseminate tubercle bacilli. It is not an unusual practice to feed the calves the mixed milk from the reactors and non-reactors, and later test them with tuberculin and slaughter under inspection for food all that react. The infection under such conditions is so seldom

that the loss is of less importance than the extra work of feeding the calves on sound milk or pasteurized milk from infected cows.

In considering the best method or methods for the control of bovine tuberculosis, the various procedures in the countries visited do not throw much light upon the problem as it confronts the dairymen of this country. The practice in all of the countries mentioned of using the milk from tuberculin reacting cows that do not exhibit symptoms, and the freedom in selling such animals, makes it possible for dairymen to clean up their herds without great financial loss and at the same time encourage them to do so. The experience in Europe tends very strongly to the issue whether in the government control of tuberculosis cases of infection not recognizable on physical examination should be included in so far as compulsion of action is concerned. The lesson from the experience in Denmark is that in order to keep herds free from tuberculosis the owner must be educated in the nature of the disease and that until he is thus educated there is little hope of securing herds permanently free from this disease. The essential value of the Bang method lies in the fact that when a herd is purified by it the owner has become so thoroughly versed in the nature of the disease that he is able thereafter to keep his animals free from it. The impression that methods for the control of tuberculosis can not be too radical so long as the disease is widespread, and that its eradication will be brought about through a process of cutting off the animals that are most active in disseminating the virus and gradually eliminating all that are infected, seems to circumscribe the problem.

THE NEW YORK STATE DEPARTMENT OF AGRICULTURE is continuing its fight against dishonesty in the form of reports on tuberculin tests. The latest success is a judgment of a few days ago in Putnam County against a veterinarian who had issued certificates representing that cows had successfully passed a tuberculin test when no test had been made. The defendant was fined \$200 and costs and was debarred from further practice in the state. Some other cases are pending.

REPORTS OF CASES.

HYDROPS OF FOETAL MEMBRANES IN COWS.

By S. R. HOWARD, V. S., Hillsboro, Ohio.

The subject of both illustrations the writer saw several times during her eighth month of pregnancy and immediately after she had calved. She stood just four feet in height and at my first visit she measured nine feet in abdominal girth. She delivered a fair-sized dead foetus and placenta some twenty days after her normal period of gestation had elapsed, losing three feet in girth from measurement made about two months before. Nine feet does not read as much of a circumstance, but when we compare such animals as, for instance, the colossal ox "Jerry," a pure-



bred Holstein-Friesian, owned by J. D. Avery, Buckland, Mass., that measured $17\frac{1}{2}$ hands, 15 feet 11 inches in length, weighing 4,365 pounds, and girth only $1\frac{1}{4}$ feet more, or $10\frac{1}{4}$ feet, we can almost imagine the distension of this little six-year-old cow. Of

course she measured more than nine feet when she calved, that occurring about two months after she measured nine feet.

She finally improved and went to market. In twenty odd years of practice I have met a number of such cases. When the mother eats well, has no pain nor fever, appears cheerful and can get up easily even when the normal period of gestation has



arrived or long passed, it has been my practice (with one exception) to let her alone. I admit on good authority that hernia may occur, but such complications are rare. This exceptional case was a very large, aged, debilitated cow, unable to rise, enormously distended, and whose period had passed. I dilated the os and many many gallons of fluid escaped. Using a blunt hook and inserting my entire 31-inch arm, I tried to reach the foetus, but all in vain, even with the aid of external pressure and bolstering up the fore parts of the cow.

I found I was groping in an immense flaccid cavity containing a perfect sea of fluid. I would remind the beginner that upon exploring the uterus of the cow in this disease, he will discover the inter-corneal partition very close to the os. Don't get rattled. Let it alone! I gave her stimulants, left her in the above position, returned in several hours and delivered an immature calf. The cow died in several hours. The repeated personal experience

of several practitioners has led me to believe that dilating or puncturing the os is very apt to lead the way to a fatal termination. From authority I learn that when the calf from such a cow does survive, it is too feeble and is practically worthless. Anyhow the owner wishes to save the cow. That is plainly our duty. I have operated on a number, and as far as I now remember I have had no bad results. All cases that I have observed have had plenty of range for exercise, and good food.

I mean I have punctured with a good-sized horse trocar the right abdominal wall, thus relieving intra-abdominal pressure. Some splendid authorities advise against this procedure which sometimes produces parturition.

Too copious evacuation must be guarded against, else we may have cerebral anemia, which is bad for the patient and embarrassing to the attendant. Normally the quantity of amniotic fluid of the cow at full time of parturition is about 6 quarts, that of the alontoic being from 7 to 17 quarts. I was once called to treat a small white shorthorn cow that was so distended she had the utmost difficulty in pulling herself through a good-sized door. She was undoubtedly with calf and six months over due. Such enormous distension I never expect to see again. Still she appeared well and actually galloped around the field, so that it was trying to catch her. From the canula inserted low in the right flank, the fluid uninterruptedly streamed with great force for near several hours. This occurred in the fall. By spring she was in fair condition, and it was believed she was still with calf.

With other cattle she went to market. This has been the end of those I treated. Whether one or both membranes are drop-sical cannot be clinically diagnosed, and is of trivial importance to the practitioner.

DR. GEO. H. GLOVER acted as assistant superintendent of the cattle department and as one of the live stock judges at the Colorado State Fair held in Pueblo the week of September 19, 1910.

THE NEW YORK STATE VETERINARY MEDICAL SOCIETY kept up its reputation for hard work and much accomplished at the annual meeting at Ithaca, August 25th to 27th last. Splendid papers were presented and earnestly discussed, and nine operations were performed on the last day. A complete report of this important meeting will be published in the next issue of the REVIEW, as space does not permit of it in the present one.

CORRESPONDENCE.

WOODBURY, N. J., September 13, 1910.

Editor AMERICAN VETERINARY REVIEW:

In the last two issues of the Bulletin of the Chicago Veterinary College are articles attacking the methods followed by State Board Examiners and saying in substance that such examinations are ridiculously severe and unpractical.

As an old examiner I do not feel that these strictures are justified, and I crave sufficient of your space to tell the Chicago College staff how the matter looks from the standpoint of the examiner.

First—The *state*, not the examiner, decides what subjects shall be covered by the examination.

Second—The state desires to ascertain through the medium of these examinations two things, *i. e.*, whether the candidate is fitted to serve it in a scientific capacity should it call on him for such service, and whether he is to be trusted to properly care for the live stock owned by its taxpayers. If there is any other object in the state examination it has not come to my notice.

Now while the state has no motives other than those I have just outlined in demanding a state qualification for the practice of veterinary medicine, the profession at large has been greatly benefited by the passage of these laws.

It is a truism that if good money and worn or sweated money are allowed in circulation at the same time (I am of course alluding to coined money) that the poor clipped money will drive the good money out of circulation. No one will pay a debt with a good dollar if he can pay it with a poor one, hence the good money is driven out of circulation; it is hoarded. In a condition of affairs that permits the unlicensed practice of medicine a similar condition necessarily occurs. *The bulk of the students seek the shortest and cheapest cut into the profession.* In thus following the lines of least resistance, they are not necessarily picking out the poor school—they don't know it is poor, they do know that a diploma is easily obtained from it. They see, too,

its graduates competing more or less successfully with men holding diplomas from the great universities, and when the latter ask of them more time and more work, and demand from them a higher grade of examination, they say no. *The poor school crowds out the good school.* Doubt on this subject will be dispelled by comparing the class list of such schools as Cornell or the University of Pennsylvania before and after the establishment of State Boards of Examiners.

Now a State Board must have *some* standard. What shall it be? There can surely be no hardship to any school if the standard is made to correspond with the examinations of the veterinary schools of the highest grade, because these good schools have demonstrated the possibility of maintaining such a standard. The state has a right to demand the best and to insist that it gets it. Furthermore, if any veterinary school on this continent, good, bad, or indifferent, *will make its teaching correspond with its printed announcement*, its graduates will have no difficulty in passing the examination of the most exacting State Board. If teaching schools have an idea that the only function of a State Board of Examiners is to O. K. diplomas, irrespective of the qualifications of their owners, why they have another guess.

Yours very respectfully,
T. B. ROGERS, D.V.S.

CAMP GREGG, P. I., July 20, 1910.

Editors AMERICAN VETERINARY REVIEW, New York City:

Please inform me through the REVIEW what is meant by a "Mule Foot Hog," and oblige.

Yours respectfully,
FRED FOSTER, Vet. 2d F. A.

TWENTY-FIVE states, the District of Columbia, British Columbia, Canada, and New Zealand were represented at the A. V. M. A. convention in San Francisco.

THE freshman class of the Colorado Agricultural College has increased 100 per cent. this year. The Division of Veterinary Science is holding its own with the other divisions.

OBITUARY.

ANDREW SMITH, V.S. (Edin), F.R.C.V.S.

Professor Andrew Smith died at his home in Toronto, Canada, on August 15, last, at the good old age of seventy-five years. Professor Smith was born at Dalrymple, Scotland, in 1835. When he had reached maturity his love of animals, good horses particularly, led him to take up the study of veterinary medicine; and being a Scotchman, he naturally turned to the renowned leader of his profession in his native land, Professor Dick, of Edinburgh. In those early days, qualified veterinarians were few in Canada, as was the case in the United States, and, at the persuasion of a large number of owners of good horses in that country, Professor Smith came there in 1861 and had been there but a year when he gave a course of lectures to a small class of students in Toronto, which formed the nucleus from which developed the Ontario Veterinary College, of which he remained the active head until it was taken over by the University of Toronto in 1908. "Andy" Smith, as he was affectionately termed, was the most widely known veterinarian in America, having passed three thousand students from his school, who are located all over the United States and Canada, whom he had the happy faculty of remembering whenever and wherever he met them. He was a man highly respected in the community in which he lived his long life. The high esteem in which he was held by his friends and neighbors, and the powerful influence he had among them, attest the integrity and the strength of character that was mingled with his gentle, kindly nature.

SIMON JACOB JOHN HARGER, V.M.D.

Dr. Simon J. J. Harger died at his home in Philadelphia, Pa., the end of August last, after a very brief illness in the form of an acute intestinal obstruction, in his forty-sixth year. Born at

Hechtown, Pa., he received his early education in the public schools of his native county (Northampton), finishing at the Keystone Normal School at Kutztown in 1884, when he entered the Veterinary Department of the University of Pennsylvania, from which school he graduated in 1887, when, from his peculiar liking for and proficiency in anatomy, he was made demonstrator for his alma mater the same year. Four years later he was made Professor of Veterinary Anatomy and Zootechnics, which position he held at the time of his death.

As a teacher he was loved and respected by his pupils, as attested by the fact that at the close of the school term in June last, the *Veterinary Record*, published by the senior class, was dedicated to him in the following beautiful words: * * * "Deeply mindful of his many kindnesses, and sincerely appreciating his many personal sacrifices for our benefit, we, the class of 1910, dedicate this volume, our class record, to Dr. Simon J. J. Harger."

In literature he has done much for which the veterinary profession is his debtor. His translation of the work of Gonbaux and Barrier, on the "Exterior of the Horse," has been of incalculable value to the profession, and has laid the ground work from which many veterinary students have developed into connoisseurs on the horse.

He was an editor on the *Veterinary Magazine*, 1894-7. During his professional life, Dr. Harger has always engaged in general practice in the city of Philadelphia, with a natural taste for surgery in which he had more than ordinary ability, and was an expert in certain special operations.

He was an active member of the American, Pennsylvania and Keystone Veterinary Medical Associations, and was not only always willing to contribute his full share of work to them, but also to other veterinary associations of which he was not a member. His loss will be keenly felt by all whose privilege it was to have known him, and especially by his co-workers in the University of Pennsylvania Veterinary School.

RICHARD EDWARD BUCKLEY, D.V.S.

Dr. Richard E. Buckley died at Rutland, Mass., where he had been sojourning for his health, on August 19 last, in his forty-fourth year, from a lingering illness.

Dr. Buckley graduated from the American Veterinary College in 1887, and had practised his profession in New York City up to the time that he became ill, when he went to the country with the hope of benefiting his health.

He had had complete charge of the horses of the George Ehret brewery ever since he began to practice his profession, and had also, for a number of years, been a municipal veterinarian. He is survived by his father and a brother, who is also a veterinarian.

Just as we are closing our forms, we have learned of the deaths of Dr. Henry Moore, of Albany, N. Y., at the ripe old age of 96 years, and of Dr. William R. Howe, of Indianapolis, Ind. Dr. Moore's death occurred on September 19th, and Dr. Howe departed this world May 31st last.

PRESIDENT HOLLINGWORTH, in his address to the members of the New York State Veterinary Medical Society at Ithaca the last week in August, dealt with seventeen different topics, to all of which he had evidently given considerable thought.

WE note with regret, in the *Boston Journal* of September 29th, the appointment by Governor Draper, of Massachusetts, of a layman to succeed a veterinarian as Chief of the Cattle Commission of that commonwealth. For while the newly appointed chief, Mr. Fred. Freeland Walker, of Burlington, an extensive raiser of Holstein and Jersey cattle, Master of Woburn Grange, member of the Massachusetts Cattle Owners' Association and of the New England Holstein-Friesian Breeders' Club, who is probably as estimable a gentleman as he is evidently a progressive one, would no doubt have been a valuable acquisition to a commission of that kind with a qualified veterinarian at its head, it is not likely that the gentleman in question differs from most other laymen in his inability to appreciate and cope with the numerous medical problems that are constantly cropping up in a position of that nature, that can only be met by men who have been educated and trained along veterinary medical lines.

SOCIETY MEETINGS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

The forty-seventh annual meeting of the American Veterinary Medical Association was called to order in the Gold Room of the Palace Hotel, San Francisco, California, Tuesday, September, 6 1910, President A. D. Melvin in the chair.

THE PRESIDENT—The forty-seventh annual meeting of the American Veterinary Medical Association is now declared formally opened. It is a great pleasure indeed for me to meet with all of the comrades under these various magnificent and pleasant surroundings. Many of us have traveled quite a distance over the hot sand to get here, some of us for the second time, but we are all here nevertheless, and safely here, after somewhat threatening circumstances.

The city in which we now meet is one of the most remarkable, considering the great disaster which happened here four years ago, and the civic enterprise and pride which has been exhibited here, that is to be found anywhere. The solidity and splendor with which the city has been rebuilt on the magnificent scale which we see here at present is one of the marvels of the Western Hemisphere, and it affords me great pleasure to introduce the gentleman who is now in charge of the city government here, Mayor McCarthy.

MAYOR McCARTHY—Mr. Chairman and members of the American Veterinary Medical Association in attendance at this convention, allow me to say to you, or allow me to assure you that I am indeed very much pleased at being, on behalf of the people of this city and town, afforded the opportunity to look into your countenances this morning and welcome you to our city of San Francisco, and, as you may have gathered from the remarks of your chairman, we are indeed glad to occupy now a position of being able to entertain people from abroad. There was a time after the great happening here when we could not do that. During that time every effort of the government and

of our citizens was devoted to taking care of ourselves, but having finished that job, as we think in fairly good shape, we are now happy indeed, as I have just said to you, to entertain people from abroad. You are now in a city, or meeting in a convention in a city whose people have overcome, or the people of which (to put it in a little better form) have overcome more trouble and more dangers than any other city in the universe anywhere. I say that advisedly. Many there are who are under the impression that we had a tremendous shaking up of the earth's surface on which the city rests. Many there are who feel that the destruction of this great city of ours, which, my friends, was one of the greatest cities within the boundary lines of America, on the 18th day of April, 1906, was due to a disturbance of the earth, but such was not the case. This magnificent building, within the walls of which you are about to meet, was in every respect, save and except the method of building and structure, just as magnificent then as it is now. There is not one solitary part of the building which was removed in the remotest manner from its moorings by what is supposed to have been the wonderful earthquake that took place in San Francisco on that date. Not one building constructed with up-to-date methods suffered in the least. But they did suffer from that destroying element which up to date the most intelligent, the most painstaking engineers and architects of this and other countries have failed to offset or to prevent—fire. It has been the custom of this great city of ours, and I do not say this because I am a Californian; I was not born here; I am not a native son; I was born across the water; not even born in the United States. I call this to your attention, and I say it because experience has taught me to know and understand thoroughly that the people of San Francisco when they take hold of anything from the standpoint of doing it, do it pretty well, and give it as bold a front, as massive, complete and thorough an appearance as any people with whom I have had the pleasure of meeting anywhere. The fire with which the city was stricken carrying out that policy as it were, the principle and platform of the people of this city, when it came along it proceeded to eat things up on such a magnitude that it surprised even the old-time San Franciscans at the manner in which it discharged the duties of its terrible office. The San Francisco fire, ladies and gentlemen, was greater from the standpoint of destruction, than any that has ever taken place in the civilized world. You will

possibly realize the magnitude of it when I say to you—and, in fact, figures do not lie, though some of them who put the figures down do—but the statistics are clear, and you will see when I say to you that the fire which began with the 18th day of April, 1906, within the boundary lines of this city and county, destroyed property, real and personal, to the extent of two hundred and thirty-five millions of dollars, more than the Chicago, more than the Baltimore, Chicago and Boston fires combined. I think you will then realize the loss that the people bore who lived in this city, and you will, I hope, be satisfied that this hope of mine is going to come true and is going to be realized, namely, that San Francisco is soon to become, if, in fact, she has not already taken her place again as one of the leading cities of the world, because, knowing as I do the character, reputation and standing for hospitality of the citizens of this city, and knowing as I do the energy, resources and determination of the men who live here, I know that this hope will be realized. I have a further hope, ladies and gentlemen, which I wish to lay before you, and that hope is that before you leave us you will make it your business to go around this city and see for yourselves the improvements made by the people of this city since that fire cooled in a manner calculated to give us an opportunity to proceed with the reconstruction. No city in the world, no people living in any city of the world of which I have any knowledge, have displayed a greater courage and presented that determination and grit characteristic of the American citizen to a greater degree than the people of San Francisco in rebuilding, and that, too, with very little financial assistance from abroad. (Applause.) Not but what we are always in as hospitable a mood and as willing to reciprocate hospitality as are the people living in any other location in this or any other country, but the spirit of '49, that spirit which came from beyond the Rockies, that came from your states and from each and every one of your locations at home, possibly the spirit which led the pioneers across the Sierras and the Desert to find homes in California, it was those men—men filled with that spirit who survived the shock; it was those men who grappled with the enormous difficulties with which they were confronted—it was those men, as well as their children and their children's children, so that the very moment the opportunity was presented to them they proceeded to rebuild the old city, and to rebuild it in a manner calculated to exceed in magnificence and solidity the city which was

destroyed, and, my friends, I say it to you without any feeling of reasonable contradiction, they have proceeded with this reconstruction of the city in a manner to withstand an attack from the forces of the earth, even if it come, which God grant they never may to visit our people again. This structure may be taken as a sample of the whole, but to get an accurate idea of what has been done here, one must go up fourteen, fifteen, sixteen or twenty stories on one of the high buildings, go up on the top of the Fairmount Hotel where you can look all over the city, and then you will see within the boundary lines of these twenty-seven miles of territory spread out before you, how generally everything was eaten up by that terrible fire; churches, banking houses, libraries, business blocks, residences and apartment houses, licked up by fire as clean as the floor, so that people living here hardly knew their own property and then as you look over the change you will see what has been done since that day in the way of reconstruction. I think if some of you will do that you will say to yourselves, as I have had faith to express to you here, that the people of San Francisco have certainly done a tremendous work.

Now, ladies and gentlemen, speaking as the mayor of this city, I want to give to you an expression of opinion from all our people, and let me say to you that I sincerely hope and trust you will make it your business to see this town before you go; also the many attractive features of our city which you cannot see from the high places, but to which you must travel in a first-class conveyance in order to see in all their beauty. We have an abundance of the fastest machines in the world, and some of the finest horse flesh that has ever been raised within these United States is right here in San Francisco. We want you to take in all of these places, we want you to see not only what we have done, but what we have got here to be proud of, and, as the Mayor of this city, I am here this morning to welcome you to the city and I extend the heartiest greeting and the most complete possession of San Francisco in every manner with which your desires may be associated while you are with us, and without any restriction whatever or any annoyance. The keys of this city will be turned over to the chairman, and everything that we can do will be done to make it pleasant, and if there is anything that you want, you will kindly confer a favor upon the people of our city if you will make your wants known to the chairman, and if he does not let us know, then we will be

here to follow him up in order to punish him for not doing it. (Applause.)

Your society, your association, professional as it is, is a power for good. We are glad that you are with us. I can speak from experience. While close to our state, not removed by many thousands of miles, not by any means as far as from here to New York, through an unfortunate impact between an automobile and a street car, I had my foot broken in three different ways. I had professional services rendered to me in that city where I happened to be at the time from different branches of the medical profession, some from your profession, and, from the standpoint of the layman, with beneficial effect, so that I was fixed up so that I could get to this city finally. Your profession is one of those to which the world owes a great debt. The world owes a great debt to you because you are searchers of the science of health. The world will never be able to repay those of you who burn the midnight oil in order to get something to serve not yourselves, not to bring you wealth, power or fame, but to bring you knowledge and information in order to help some person or some animal. I repeat, the world owes you a debt that it will be very hard for it to pay: This city and this state owes you a debt for coming here and for giving us the opportunity to pay it, with the keys of the city turned over to your chairman. I am glad of this opportunity to say these few things to you and to offer you, on behalf of San Francisco, the freedom of this town. San Francisco is yours. Use it in any manner you see fit, and we will assist you in making it as pleasant for you as we can. I thank you. (Applause.)

THE PRESIDENT—We have listened to a most hearty welcome indeed from the worthy Mayor of San Francisco, and we will now have the pleasure of hearing a response to his address of welcome from our friend, counsellor and comrade, Dr. Rutherford.

DR. RUTHERFORD—Mr. President, Mr. Mayor, Ladies and Gentlemen—We have attended a great many meetings of the American Veterinary Medical Association, and we have been accorded many welcomes, but never, to my recollection has it been our privilege to receive so cordial, so eloquent, and so interesting a welcome as we have received this morning from his Honor, the Mayor of San Francisco. I am sure that we all ought to feel very much better in many ways than we did a few

minutes ago, and above all, sir, I think we ought to feel very much richer because each and every one of us now, individually, is the owner of this great city of San Francisco. You have just given it to us. Most of us would be glad to own a comparatively insignificant city and even a town lot or two might do for many of us but when we realize that this is no common city, no mean city, but that the city of San Francisco is ours, and that it has been given to us this morning by its Mayor, I am sure that we all realize the great wealth that has fallen to us so unexpectedly. (Laughter.)

We have come, many of us, a very long way, to San Francisco. This was my third attempt, speaking for myself, to reach this city. I tried twice before. Unfortunately, I was prevented by other things which came up and did not reach here, and somehow or other I felt the other day when I began my third attempt to reach San Francisco that something might happen to prevent, and when the other morning I saw the engine and cars of the train on which I was traveling to San Francisco out there in the middle of the Montana desert, I said to myself, "It has happened again." (Laughter.) However, we got here, and we are here and we appreciate the fact that we are here to a very much greater extent than perhaps the Mayor of this great city can imagine or realize.

There is not a man or woman—perhaps I ought to reverse the order of the sexes in my sentence—but I know there is not a man or woman in this room who has not had a very lively anticipation of the pleasure of visiting San Francisco, California. There is something about San Francisco, and something about California, which appeals to everyone in the civilized world. There is an element of the romantic in California, and you know the romantic is something which appeals to most every one. Away back, I do not like to say how many years ago, but it is a great many, I had the privilege of reading one of Bayard Taylor's works, whom, as you know, was one of the older American authors, and I remember in what I read in that book he described this country as it was originally and in the forty-nine years that followed. What he said has been with me in my memory ever since. Then came Bret Harte who described California as he saw it. We have not all seen it as Bret Harte saw it because he never was able to realize that California had become modernized or that it was not the California of '49 or '59 but the California of to-day. That criticism was always

done by Californians, and I have always thought it was rather foolish because any country can be modernized nowadays. Any country can be made businesslike. Any country can be made progressive and commercial, but it is a very rare country indeed which in these days of large business enterprises, progress, hustle and hurry, it is a very rare country indeed that can afford to be romantic. And it has been rather difficult for me to find any fault with Bret Harte because he was conveying the impression to some few reading people that they were romantic and that California was a romantic place. Well, we know more about California than perhaps our California friends imagine. We have always had a good impression of California, and that good impression has been strengthened, improved and added to year after year as the years have gone by. The Scripture says, "By their fruits ye shall know them." We representatives from Canada call your California fruit good. We buy it, and we pay for it, I assure you. (Laughter.) We beg to assure you, Mr. Mayor and, through you, the people of the city of San Francisco, that we believe it has been a very capital thing for California that she has had these little missionaries going out all over the world, because if "by their fruits ye shall know them," we are justified in assuming that the people themselves are as good as their fruit, and, therefore, naturally we expected to find a very high class of people when we came here.

I do not know whether San Francisco was named after St. Francis of Assisi. I am a little lame on the thing. When it comes to identifying all of the saints with the cities that have been named after them, I have to confess that I am somewhat lame. I am not sure as to the identity of them all. I have met very few of them in my time. (Laughter.) Those that I have been associating with, however, say that so far as they have known them they have not known of their presence in California, especially during her early days. (Laughter.) But there was a St. Francis of Assisi whose specialty was doing good with animals. In fact, he devoted his whole life to the care of animals, to the obliteration of cruelty, and to the encouragement of kindness to animals. In fact, he was greatly interested in the prevention of cruelty of any kind. I was thinking if this same St. Francis of Assisi might not be responsible for the naming of San Francisco, California, whether it might not be one and the same person, it is a particularly fortunate and appropriate thing that we are meeting here to-day because

our whole lives are devoted to the relief of pain and suffering in the lower animals. Of course, we need not dwell upon that phase of the subject for the present, but it has occurred to me that it might be well to look up St. Francis of Assisi and satisfy ourselves as to whether or not San Francisco is named after him.

Now we have all a very distinct and painful recollection of the impression which was created, not only throughout the whole of America, but throughout the whole world by the sad news which was flashed along the broken and stammering telegraph wires four years ago last April to the effect that this city, with all its wealth and precious associations, was but a heap of smoking ruins. The sympathy which was felt for the people of this city can hardly be expressed. It is beyond words, and that sympathy, that sorrow which was felt for the people of the city is only equaled by the feeling of astonishment and feeling of admiration which everyone has for the courage and enterprise which has restored that city. Yes, not only restored it, but erected on its ashes a city perhaps five times as magnificent as that which was destroyed. (Applause.) We have to-day ocular evidence of what has been done in this direction. We appreciate it very fully. We have listened to the earnest and heartfelt words of the Mayor when he told us some little details of the struggles through which this great community has passed, and I can assure him that he had our sympathy, not only the sympathy of this body, the American Veterinary Medical Association, which, in our own eyes, is a very great body, but it is more important still as a portion of the great American community, and of the whole world which was of the same mind with reference to the great disaster which overtook you four years ago. There never was a similar instance of enterprise, and there never was a case in which so much has been done in so short a time, and in which such magnificent courage was manifested and displayed as in this particular instance. Truly, the people of San Francisco are to be congratulated and commended for the splendid showing which they have made in recovering from that catastrophe.

We thank you, Mr. Mayor, for your kindly welcome. We intend to take full advantage of it, and I feel that you may be surprised if you deliver the keys to our worthy president, that you will be surprised at the difficulty which you may have in getting in yourself (Laughter) if you happen to come home a

little late, because just as soon as we get the keys we will see that the city is carefully locked up every night. We thank you for your welcome. We will do our best to behave ourselves, and not to injure the property which you have so kindly entrusted to us. (Applause.)

MAYOR McCARTHY—Mr. Chairman, Ladies and Gentlemen: Having a few matters to attend to on behalf of the city, I must withdraw, but wish to say before departing that I sincerely hope and trust that you will take full advantage of the keys of the city, and that you will do just as you see fit to serve the purpose and pleasures of those who are with you, and if you do that, I assure you you will not inconvenience me or the citizens of San Francisco in the least.

I appreciate very keenly the words which Dr. Rutherford has so aptly and appropriately addressed. I am very much pleased with the kindly expression of Dr. Rutherford, and I am sure if our citizens could have heard him this morning they would join with me in that regard. If they could have heard what I have heard him say this morning, our citizens would put it all over him, to put it mildly. We are a sympathetic people here, and we delight to know that we have the sympathy and kindly feelings of those abroad, both in our own country and in other countries, including Canada, our sister nation, yet peopled with a people who have come from virtually the same sources as we in America. The Canadians have always been a sympathetic people. Everything I said to you, every word I uttered here regarding the privileges which you have, and your ownership in our real and personal property, is true, and you will find no difference of opinion, I am sure, among our people with reference to that point. We are a united people in most all essential things, and while we have our little differences the same as the people in most all communities have, although I think we have ours principally in some of the newspapers, but we do not feel so sadly when once in a while we clash, that is, in the opinion of the newspaper world. Everything that I said to you is true, and my only fear is that you will not accept it, the words of Dr. Rutherford to the contrary notwithstanding. I believe if the truth were known that the doctor himself is one of those who will take in all of the sights. Any man who is mighty enough to put four railroad coaches in a ditch and then to come out with his associates uninjured, speaks most highly for the profession. (Laughter.)

Now, Mr. Chairman, permit me to take your hand in leaving. I hope you will enjoy yourself as you have never done before.

After Mayor McCarthy had departed from the convention hall amid hearty applause, the president delivered the annual address, as follows:

PRESIDENT MELVIN'S ADDRESS.

For the first time in its history of nearly half a century the American Veterinary Medical Association meets on the Pacific Coast. This gathering at the Golden Gate on the western shore of the continent is significant of the gratifying growth of our association, a growth not only in numbers and in territory represented, but in standing and prestige and in things accomplished.

In the early years of its existence, with a membership consisting of a little group of progressive and loyal veterinarians in the East, the meetings were all held in New York and Boston. In 1870 the semi-annual meeting was called for Philadelphia, but a quorum was not present. In 1884 the association invaded the Middle West and met at Cincinnati. After that the meetings continued to be held in the East for several years until Chicago was reached in 1890. Several conventions have since been held in the West, the most western point until the present year being Omaha in 1898. In 1903 the association met at Ottawa, in recognition of the considerable and increasing number of our Canadian brethren who had come into our membership. This year in coming to San Francisco we have completely spanned the continent.

Although this is our first convention on the Pacific Coast, the association has for many years had a goodly membership in the far West, and these have been among the most progressive and zealous members of the profession. The vast live stock interests of the West have naturally required the services of many veterinarians, both in private practice and in the public service. It is fitting that this important element of our membership has been recognized in the selection of a place for this meeting. There are enough members in this section of the country to insure a successful convention here, and those who have made the long journey from the East will find it an interesting experience well worth the time and expense involved.

The veterinary profession affords a worthy field for the exercise of the highest talents. The processes of nature are no less wonderful and abstruse in the lower animal organism than in the human organism, with perhaps the single exception of those pertaining to the human mind and soul; and just as great ability is required to explore and solve the mysteries of animal life and its morbid conditions as to do similar work with regard to the human race. If there is any difference in the importance of the work relating to animals as compared with that relating to human beings, this is only because of the higher value of human life, and not because of any essential difference in the problems to be dealt with. To minister to God's dumb creatures is indeed a worthy calling, and it becomes still nobler when we perceive with the advance of science the serious bearing of animal maladies on human health and life. And it can be said to the credit of those who have adopted this profession that veterinary science has fully kept pace with the advancement of other branches of science, and in some instances has even led the way.

This association has ever been a strong factor in the uplifting of the veterinary profession. It has stood for better professional education, for scientific advancement, and for high moral and ethical standards. From the beginning its membership has comprised the foremost veterinarians of the United States, and in recent years those of Canada; and it is largely through the efforts of this body that the position of respect, prestige and dignity now held by the profession has been attained. The uneducated empiric has largely given way to the modern veterinarian educated in the various branches of veterinary science. This body has had a creditable share in bringing about higher standards of education in veterinary colleges, and I am safe in saying that it still stands for those principles. The papers, reports, and discussions at its meetings have been of great practical and scientific value, and these published proceedings constitute an important part of veterinary literature. The profession is to be congratulated upon having an organization of such high aims and achievements, and veterinarians throughout the United States and Canada owe it to the profession and to themselves to give to this association their support and allegiance. The large and increasing membership is good evidence that the benefits of the association are recognized and appreciated by the profession. The requirements for membership are such that membership in this body should be regarded as something of a distinction.

The Bureau of Animal Industry, employing as it does a large number of veterinarians and having to deal with many problems requiring the services of trained and competent men, has endeavored to assist in the effort to raise the standard of veterinary education. During the past two years the bureau has investigated the courses of study and facilities for instruction at practically all veterinary schools in the United States and Canada, and the Secretary of Agriculture and the United States Civil Service Commission have prescribed certain requirements which must be met by a college in order for its graduates to be eligible to the Bureau Service. It is very gratifying to know that this effort has resulted in accomplishing the desired object to a great extent, and that the standards of the veterinary schools have been raised in some instances fully 50 per cent. The importance with which schools regard the bureau service is shown by the fact that nearly all schools have endeavored to conform to the requirements.

The training given by the colleges is of the highest value in equipping a young man for a career in the veterinary profession, yet certain natural endowments and elementary education are also important. The most practical veterinarians as a rule come from the farm; they are young men who have had experience in handling live stock and who have natural aptitude for veterinary work. This is especially true of those who are best fitted to be general practitioners. The young men of city education, however, often excel in scientific and research work and in special branches. The requirements for entrance to veterinary colleges should not be so high or exacting as to bar the young men from the country who have a fair basic education, but do not possess a degree.

It is said that a young man fresh from college knows more in his own estimation than he will know at any subsequent period of his career. It is a fact, nevertheless, that the veterinary graduate of to-day is far better equipped for his life work than was the graduate of yesterday. He lacks practical experience, but that can be acquired, and he has a good foundation on which to build it. On the other hand, what the graduate or even the non-graduate of the past lacked in educational training he has in many cases made up by experience in the course of practice and by the study of veterinary literature. It was never more important than at the present time that the veterinarian in order to be successful should keep abreast of modern progress.

The few who engage in scientific research and those who give instruction in our schools are likely to do this anyhow. But the great rank and file of the profession should not be content with the skill developed in practice or in their special work, but should ever be close students of the latest literature so as to be prepared to avail themselves of the best and latest knowledge and discoveries.

The vast majority of veterinarians of the United States and Canada are men of high integrity and are a credit to the profession. In every profession, however, some unworthy members are to be found, and our is no exception. Occasionally evidence is found of fraudulent practices upon the part of some veterinarian, which bring discredit upon the profession, such as the use of tuberculin for the purpose of rendering subsequent tests ineffective, and the making of inefficient tests and the rendering of false charts. This association should and does stand not only for high attainments, but for high character in its members and in the profession. By discountenancing and severely condemning such fraudulent practices, and by ostracizing men who are known to be guilty of them, we can do much to remove the reproach which they bring upon an honorable profession.

The veterinary profession can do great public good by disseminating correct views and information as to the diseases of animals. I wish to single out a former president of the association, Dr. Dalrymple, who has done much in this respect. Ignorance and erroneous views often prevail, and the danger of certain contagious diseases is not generally understood by the people. This is especially true of such diseases as tuberculosis and rabies. Many dairymen see no wrong in selling milk from tuberculous cows, especially when the disease has not reached a very advanced stage or does not affect the udder; whereas veterinary investigators have shown beyond doubt that cows of good outward appearance are often sources of grave danger. Perhaps rabies is the subject of more popular misconception and mystery than any other disease, yet the true nature of this malady is well understood by veterinarians. Many stock raisers do not realize the necessity for destroying the carcasses of animals that have died of anthrax, or the precautions that must be taken to prevent the spread of various contagious diseases. In matters such as these the veterinarian often has opportunity for doing a valuable educational work in his community. He should always be practical, and not too theoretical. Much of the opposi-

tion of stock owners and the public to the enforcement of live stock sanitary measures is due to lack of knowledge as to the nature of animal diseases and as to the harm done by allowing them to continue and the steps which veterinary science has shown to be necessary in dealing with them. Sometimes, however, opposition is due to a too radical position taken by veterinarians, a position which, while perhaps theoretically correct, does not make sufficient allowance for practical difficulties and the losses that may be entailed on stock owners. By taking a sensible middle ground and not endeavoring to adapt scientific theory to practical conditions with the least possible loss and inconvenience to the live stock industry, we can best succeed in dealing with such problems.

The control of tuberculosis is one of the most important problems now confronting the veterinary profession. It concerns not only the official veterinarian but the private practitioner. We have just cause for pride in the creditable part that the veterinary profession has taken in the scientific investigations throughout the world that have thrown light on the nature of this disease and the methods that must be followed for its suppression. Some of the most brilliant work in this field has been done by our profession. Throughout all the doubt and disputation in which the tuberculosis problem has been involved during the last ten years the great majority of veterinarians have held the view, well founded on scientific investigations in comparative pathology and bacteriology, that tuberculosis is communicable from bovine animals to man; and it is greatly to the credit of the profession that the correctness of this position is being steadily confirmed with the progress of scientific research. If, as seems practically certain, tuberculosis is communicable from the bovine to the human species, the problem is a vastly more serious one than if only the animal side of the question were to be considered; and the veterinary profession must have a leading part in bringing about a solution.

In my judgment the time has come for federal and state authorities to unite in some comprehensive plan for the gradual eradication of tuberculosis from cattle and hogs. As a preliminary step we should determine in what localities tuberculosis exists to the greatest extent (where this has not already been done); then the tuberculin test should be generally and systematically applied to cattle in those particular sections. Where reacting animals are of special value the herd may be handled ac-

cording to the Bang system, but under ordinary conditions it is advisable to slaughter the diseased animals. In order to reduce the financial loss to a minimum and at the same time guard against the sale of unwholesome meat, such slaughtering should be done at abattoirs that are under federal or other competent veterinary inspection. In this way a large proportion may be safely passed for food and made to yield their full meat value, while only those whose meat may be dangerous to health will be condemned. As the slaughter of tuberculous cattle would be done largely as a public health measure, it is only reasonable that the state should pay indemnity, at least in part.

In the District of Columbia tuberculosis has been dealt with as a contagious disease. During the past year all cattle have been tested with tuberculin, the reactors slaughtered under inspection, and the owners reimbursed. Retests of herds where disease has been found are made at intervals of six months and the tuberculin test is required as a condition to bringing cattle into the District.

This association at its last meeting recognized the gravity of the tuberculosis problem by appointing a commission to consider the subject and report as to the best methods of dealing with the problem, and the report of this committee at this convention is expected to fix a basis for a sound policy.

While the work of eradicating tuberculosis will devolve mainly upon official veterinarians, the practitioner can render good service. He can disseminate correct information on the subject among stock owners and can give advice to his clients that will enable them to keep the disease out of their herds, or to make proper disposition of animals if they already have it, without waiting for official action.

Fairs and live stock shows as at present conducted afford favorable conditions for the spread of tuberculosis. Cattle are brought together from various places, and there is frequently a considerable proportion of tuberculous animals among those exhibited. As a rule nothing is done by the management to determine whether or not animals offered for exhibition are healthy, and prizes are given indiscriminately to those presenting the best appearance without regard to whether or not they are affected with tuberculosis. The suggestion has been made that prizes should be given only to animals that are in a healthy condition, and that the presence of tuberculosis or other contagious disease shoud constitute a disqualification. In fact, ani-

mals should not be admitted at all to such exhibitions unless their health is assured. Veterinarians are usually employed in connection with live-stock exhibitions, and they can doubtless by their advice and influence do much to bring about a reform.

The past year has been marked by steady advancement in various lines of veterinary work. Domestic animals are constantly enhancing in value, and it is becoming more and more to the interest of their owners to have them provided with the best veterinary attention. This condition offers a good field for the practitioner, and inducements for entering practice were probably never so great as to-day.

In the administrative work of the public service gratifying progress has been made in the warfare against contagious diseases. Continued headway in eradicating scabies of sheep and cattle has led to the removal of the quarantines from large additional areas in the West, and we are hopeful that the end of these diseases in the United States is in sight. The stupendous undertaking of exterminating the catte ticks, which means so much for agriculture and the live stock industry in the South, is progressing so favorably as to give assurance that in the course of some years we shall succeed in eradicating this pest from the United States and thus add another triumph to those already achieved by veterinary sanitary science in successfully combating pleuro-pneumonia and foot-and-mouth disease. Already the beneficial results of this work are being realized to a substantial degree in the localities which have so far been freed from ticks.

About two years ago we were confronted with a virulent form of necrobacillosis which appeared among sheep in Wyoming and threatened to spread and do great damage to the sheep industry and perhaps to extend to other species. It is a cause for congratulation that the quarantine and methods of treatment carried out under the direction and co-operation of federal and state officers, aided perhaps by the drouth of the past season, has greatly reduced the prevalence of this disease. About one-fourth of the area under quarantine a year ago was recently released, and the number of cases in the territory remaining in quarantine has been reduced about 50 or 75 per cent. We hope to be able to release two or three more counties during the coming winter, and with a continuance of favorable conditions the complete removal of the quarantine should follow within another year or two.

The Bureau of Animal Industry has continued its work on hog cholera with a view of perfecting the serum treatment and to rendering this treatment available to the hog raisers of the country through the co-operation of state authorities. The preparation of serum is being successfully and economically carried on by a number of states.

Much good work has been done during the year by the authorities of several cities and states, aided by the Bureau, in the way of improving the wholesomeness of the milk supply.

In the field of scientific research some good work has also been done. A number of investigators have continued their study of tuberculosis, and other diseases have also been studied, with the result that our knowledge is constantly being increased. Special attention has been given to the obscure disease known as bighead of sheep; and while a solution has not been reached, certain facts have been learned which indicate the course to be followed in further investigation and give hope of an ultimate solution. One of the most promising investigations of the year relates to a new method for the diagnosis of glanders. This method was suggested to the Bureau of Animal Industry by a foreign correspondent, and work so far done by the Bureau indicates that it is remarkably successful and practicable and will be a great improvement over the mallein test and other methods of diagnosis now in use. A paper describing this work will be presented at this meeting.

The federal meat inspection engages the services of more veterinarians than does any other branch of the public service. This inspection now covers slightly more than half of the total meat supply of the United States. Most of the remainder is not inspected at all, while a small part of it receives some kind of inspection by state or municipal authorities. I have strongly advocated that this vast amount of uninspected meat, which does not enter interstate or export trade and is therefore beyond the reach of the federal government, should be looked after by the states and municipalities; and I have advised that the only way to secure efficient inspection is to have it done so far as possible by competent veterinarians at the time of slaughter. It is necessary for the protection of public health that the states and municipalities should provide inspection for meat killed and sold locally, and in some states and cities the importance of doing this is being felt and steps are being taken or consid-

ered for establishing inspection. This work opens another field for the services of the veterinarian.

Conservation is a topic about which very much is heard nowadays, and a public address that did not make some reference to it could not be regarded as at all complete. It is pleasing to know that the veterinarian is really an important factor in this worthy cause. The value of the work of the veterinary profession, while better appreciated now than formerly, is not yet generally realized. This work promotes the conservation of our domestic animals, which means the conservation of a very important part of the food supply of the people, and in turn the conservation of human health and life, which after all is the acme of conservation. As has been truly stated by a prominent citizen of this state, the conservation of food comes before morals or religion. Viewed in this light, the work of the veterinarian is not only of great economic value; it is something still higher; it is an important agency for human welfare.

That this high conception of the sphere of the veterinarian is not recognized in some quarters is shown by the proposal to create in our national government a Department of Public Health, and to transfer to that department the entire veterinary service of the Department of Agriculture, thus removing from the direction of the veterinary profession the work which it has built up and of which it has been in charge for so many years, and placing this work under the charge of the medical profession. The general proposition to provide better government facilities for safeguarding and promoting human health is entirely commendable and calls for our support rather than opposition. It is only with the special plan proposed for accomplishing this object that we can find fault. I believe that the advocates of a Department of Health have been carried away by zeal in a good cause and have proposed to include in the new department branches of the government service which really do not belong there, but I doubt if they can ever be brought fully to this point of view.

Several bills are pending in Congress for the establishment of a Department of Bureau of Public Health. By the bill that is being most actively pushed it is proposed to establish a new executive department and to transfer to that department not only the Bureau of Animal Industry and certain other branches of the Department of Agriculture, but all matters within the

control of the federal government relating to "diseases of animal life" and all departments and bureaus (excepting those in the War and Navy Departments) "affecting the * * * biological * * * service, or any questions relative thereto." This language is so broad as to cover work relating to plant life, such as forestry, the growing of field crops, fruit culture, etc. To place work of this kind in a Department of Public Health is so preposterous that I am sure the advocates of the measure do not really intend to do this; yet such is the meaning of the language employed in the bill. Other bills not so sweeping in scope provide for the transfer to the proposed Department or Bureau of Public Health of certain portions of the work of the Bureau of Animal Industry, such as the meat inspection.

It can readily be seen that these things are not at all essential to the establishment of an efficient Department or Bureau of Public Health. It would be entirely practicable to take the existing United States Public Health and Marine Hospital Service as a nucleus and by giving it more money and greater power where needed enlarge it into an organization which would meet all the needs of the public health, without disturbing other branches of the government service.

The feature of the plan which most concerns this association is the proposal to transfer all or a part of the work of the Bureau of Animal Industry to a Department or Bureau of Public Health. The Bureau of Animal Industry deals with the live stock interests and is largely a veterinary organization. Aside from its veterinary work, it covers such subjects as the breeding and feeding of live stock, also dairy practice and methods, including the manufacture of cheese, butter, etc. Surely work of this kind has no place in a Department of Public Health, and the proposal to transfer the entire Bureau of Animal Industry indicates that the advocates of such a measure have no adequate conception of the scope of the work actually carried on by the Bureau.

The Bureau of Animal Industry is essentially an agricultural organization and deals primarily with agriculture, and its logical place is in the Department of Agriculture, even though some branches of its work have an important bearing on the public health. Even in the portions of the bureau's work of which the protection of human health is an important object, the problems are mainly agricultural and must be attacked from that side.

The production and conservation of the public food supply are of the highest importance to human health, but the measures

by which such production and conservation are accomplished are mainly agricultural. In other words, while the *end* is a matter of public health, the *means* of accomplishing that end constitute an agricultural problem; and the Department of Agriculture is certainly the most appropriate agency for carrying out such agricultural means. To maintain an adequate supply of food-producing animals to meet the needs of our people, not only must methods of breeding and feeding live stock be studied and applied, but diseases of animals must be studied and combated; and all this work is an integral part of one great problem and should not be separated.

Advocates of the Health Department often point to the large amounts expended by the government for the protection of the health of live stock, and contrast this with the small appropriations for the health of the people. It is said that the government should do as much for the babies as it does for the hogs. Such arguments are fallacious and misleading. The money appropriated by Congress for the work of the Bureau of Animal Industry is not appropriated because of any sentimental feeling for the welfare of the animals themselves, but the real object is to provide a sufficient and wholesome supply of food for the preservation of human life and health.

There are strong administrative and economical reasons why the work of the Bureau of Animal Industry should remain intact and in the Department of Agriculture. It is erroneous to argue that the consolidation of the various government agencies having a bearing in any way on the public health into one department would be an economy. If this bureau were removed from the Department of Agriculture it would be necessary for that department to replace a large part of the organization, if it continued to deal efficiently with agriculture, and this would duplicate expense. The present organization permits the use of the same men (under various appropriations) in different lines of work, and their transfer from time to time to meet the needs of the service. For example, in the emergency caused by the outbreak of contagious foot-and-mouth disease in the winter of 1908 it was possible to draw immediately on a trained force of veterinarians and scientists already engaged in the meat inspection and other regular work of the Bureau. Had the work been organized differently this would have been impracticable or impossible, and while a force was being organized, the contagion would very probably have spread widely and reached the great

stock raising regions of the West, where it would have caused tremendous damage and loss and where its eradication would have been exceedingly difficult and expensive. The regular field work in eradicating diseases of animals is mostly done during the summer, while the work of slaughter houses is heaviest during the winter; and a number of men can be utilized for field work in the summer and for meat inspection in the winter, thus effecting an economy which would not be possible if these lines of work were not under the same management.

Work such as the meat inspection and that dealing with diseases of animals should not only be performed by veterinarians, but should remain under their control and direction. The transfer of this work or any part of it to the proposed Department or Bureau of Public Health would result in placing veterinary work under the direction of members of the medical profession, and would consequently subordinate the veterinary work to that relating to human medicine. Such a change in my judgment would not only greatly impair the efficiency of the work, but would be distasteful to members of the veterinary profession. A physician, no matter how capable, is not qualified, without proper veterinary training, to conduct or direct such work as the meat inspection or the investigation and eradication of animal diseases. The government's veterinary work should by all means remain under veterinary direction, even if regarded solely from the standpoint of efficiency without any regard to professional pride.

Let us keep these matters in mind and try to maintain one branch of the government which is principally one of veterinary science, for a change may mean much not only to the profession of to-day, but for all time. Since we last met a number of our associates have crossed the Great Divide, as we must all do. We stop to pay our last respects, then the ranks close up and on we march, for such is life, and such is death. A convention such as this has many pleasant associations and beneficial influences. It broadens the view, and cultivates a spirit of fraternity and good fellowship. We come together to consider things affecting the welfare and progress of our profession, and take action to promote these objects. The papers, reports and clinics are instructive and valuable. For many a busy man it is a vacation, a time of relaxation from work, an occasion for renewing old acquaintances and forming new ones. It is a time of instruction and enjoyment. Let us make the most of it in every way.

THE ATTENDANCE.

Members.

CALIFORNIA—Geo. H. Locke, Carl W. Fisher, Wm. F. Egan, C. M. Haring, W. M. McKellar, W. E. D. Morrison, H. H. Hicks, H. E. Torgersen, M. Rosenberger, P. H. Browning, J. A. Grau, David F. Fox, H. J. Hammond, C. E. Price, F. H. McNair, C. B. Roadhouse, J. H. Webster, R. A. Archibald, A. V. Hall, H. W. Rike, Chas. Keane, Clarence Loveberry, Charles Eastman, J. J. Summerfield.

CONNECTICUT—Richard P. Lyman.

CANADA—J. A. Stevenson, H. Higgins, E. A. A. Grange, C. D. McGilvary, J. G. Rutherford.

COLORADO—B. F. Kaupp, Geo. H. Glover, Charles G. Lamb, A. J. Savage.

DISTRICT OF COLUMBIA—A. D. Melvin, John R. Mohler.

ILLINOIS—James Robertson, L. A. Merillat, Joseph Hughes, John F. Ryan, Herbert F. Palmer, O. E. Dyson.

INDIANA—G. H. Roberts, W. B. Craig, J. C. Rodger.

IDAHO—F. W. Chamberlain, G. E. Noble.

IOWA—G. A. Johnson, Paul O. Koto, W. W. Dimock.

KANSAS—F. S. Schoenleber, Alex. Plummer.

MINNESOTA—F. A. Ilstrup, M. H. Reynolds.

MISSOURI—F. F. Brown, S. Stewart, A. T. Kinsley, B. W. Murphy, Wm. Locke.

MONTANA—W. J. Taylor.

MICHIGAN—S. Brenton, J. S. Donald.

MASSACHUSETTS—J. F. Winchester, Francis Abele, Jr.

MARYLAND—William Dougherty.

NEBRASKA—W. K. O'Neal, J. L. Hoyleman, P. Juckniess.

NEW YORK—Otto Faust, J. L. Robertson, W. H. Kelly, R. W. Ellis, P. A. Fish.

NEVADA—W. B. Mack, J. O. Jacobs.

OHIO—A. S. Cooley, E. H. Shepard, N. C. Hillock, J. H. Blattenberg.

OREGON—H. Nunn, W. D. Wright.

PENNSYLVANIA—S. E. Weber, C. J. Marshall, F. H. Schneider, Otto G. Noack, W. Horace Hoskins.

SOUTH DAKOTA—H. O. Moore.

TENNESSEE—Geo. R. White.

WASHINGTON—C. H. Schultz, W. E. Robertson, E. D. Kennedy, S. B. Nelson.

WISCONSIN—D. B. Clark, H. F. Eckert,

Visitors.

CALIFORNIA—Mr. F. L. Clark, Prof. W. B. Hermis, Dr. G. H. Eickhoff, Dr. A. L. Metz, Mr. P. S. Holden, Mr. A. F. Jacobs, Dr. L. E. Tuttle, Dr. Thomas E. Carroll, Mr. Herbert Struthers, Mr. C. H. Bradley, Mr. Sterling Price, Mr. C. M. Turning, Mr. J. A. Dell, Dr. C. F. Edwards, Mr. C. W. Hobbs, Mr. W. E. Noble, Mr. R. K. Wright, Mr. Clyde O. Napier, Mr. Harold Carpenter, Mr. I. G. Cockroft, Mr. L. A. McAfee, Dr. C. C. Walker, Mr. Thomas R. Creely, Mr. Ira Dalziel, Mr. Baker Browning, Mr. Barclay Ricks, Mr. J. A. Woodside, Dr. T. O. Anders, Mr. B. H. Priest, Mr. J. E. Quinn, Dr. A. S. Williams, Mr. H. C. Johnson, Dr. H. Bergh, Dr. Thomas Rundel, Mr. E. R. McCullough, Dr. A. F. Eagle, Mr. Fred Goldager, Dr. Chas. Struthers, Mr. J. A. Lepley, Dr. F. N. Sawyer, Dr. F. Segsworth, Dr. M. J. O'Rourke, Dr. G. Edwards Metthews, Dr. C. A. Raque, Dr. L. A. Danielson, Dr. Geo. J. Donnelly, Dr. Oscar J. Kron, Dr. A. C. Rosenberger, Dr. C. Sears, Dr. Geo. R. Ward, Dr. Geo. Gordon, Dr. J. A. Hill, Dr. A. P. Jacobs, Dr. M. L. Pattison, Dr. Otis A. Longley, Dr. C. O. Durfee, Dr. R. T. Whittlesey, Dr. W. A. Boucher, Dr. Frank Griffith, Dr. Geo. S. Baker, Mr. K. F. Gittings, Dr. G. W. Closson, Dr. A. D. Hubbell, Dr. J. A. DeSerpa, Dr. C. B. Outhier, Dr. E. J. Creely, Dr. J. P. Iverson, Dr. Geo. S. Rey, Dr. J. F. Ast, Dr. H. W. C. Lehlenwalter, Dr. William McPhillips, Dr. J. O. Dell, Dr. W. J. Caldwell, Dr. G. F. Faulkner, Dr. E. J. Fallon, Dr. C. L. Megowan, Dr. J. P. O'Connor, Dr. R. B. Corcoran, Dr. A. R. Sorensen, Dr. J. J. Hogarty, Dr. M. J. Brady, Dr. L. C. Hoffman, Dr. L. M. Steckel, Dr. W. W. Thomas, Mr. S. J. Platt, Dr. T. B. Howard, Dr. F. W. Orme, Dr. C. A. Dukes, Dr. L. A. Covel, Mr. J. N. Patterson, Dr. Tom Carpenter, Dr. H. A. Turner, Dr. E. G. Smart, Dr. H. D. Fenimore, Dr. H. A. Spencer, Hon. Julius Kahn, Dr. James Boyd, Dr. R. M. Olsen-Seffer, Dr. C. F. McCarthy, Dr. Norman Neilson, Mr. H. E. Allen, Dr. H. R. Jackson, Dr. J. B. Boomer, Dr. W. B. Childs, Mr. R. S. Eastman, Dr. Ward B. Rowland, Dr. P. W. Goodwin, Dr. A. C. Brown, Dr. E. B. Cockerton, Dr. John F. Force.

BRITISH COLUMBIA—Dr. Thomas Bowhill.

COLORADO—Dr. L. L. Glynn.

CONNECTICUT—Mr. Chas. F. Roberts.

WASHINGTON, D. C.—Mr. William M. Mohler.

ILLINOIS—Dr. C. P. Shaughnessy, Dr. F. W. Christiansen.

IOWA—Mr. L. F. Potter.

- KANSAS—Dr. Andrew S. Donovan.
MINNESOTA—Mr. Harry Evenson.
MISSOURI—Dr. C. M. Scott, Mr. A. S. Kinsley.
MICHIGAN—Mr. John Zieg.
MASSACHUSETTS—Dr. M. F. Sullivan.
NEW YORK—Mr. W. H. Kelly, Jr., Dr. C. C. Oderkick, Col. William F. Kirchner, Dr. Robert S. MacKellar, Dr. Wm. J. McKinney.
NEW ZEALAND—Dr. F. J. Quick.
NEW JERSEY—Dr. W. Runge.
NEVADA—Dr. B. G. Dill, Dr. T. F. Richardson.
OHIO—Dr. Jerome Orr.
OREGON—Dr. W. H. Lytle, Dr. S. J. Carney, Dr. A. G. Smith, Mr. Harry Nunn, Dr. J. Sullivan, Dr. A. C. Johnson.
PENNSYLVANIA—Mr. H. B. Brooks, Dr. John C. Foelker.
UTAH—Dr. John H. Halton.
WASHINGTON—Dr. A. W. Small, Dr. S. T. Miller, Mr. Russell T. Miller, Dr. J. T. Seely.
WISCONSIN—Mr. W. F. Eckert.

Ladies.

- CALIFORNIA—Mrs. J. F. Ast, Mrs. H. W. Rike, Mrs. C. B. Outhier, Mrs. G. S. Baker, Mrs. F. M. Sawyer, Mrs. W. McPhilips, Mrs. G. S. Rey, Mrs. Walter Lillick, Mrs. Ed. J. Creely, Mrs. L. A. Tuttle, Mrs. R. F. Gittings, Mrs. C. F. McCarthy, Mrs. E. A. Haring, Mrs. C. M. Haring, Mrs. G. W. Closson, Miss L. A. Savage, Mrs. Annie Griffith, Mrs. A. D. Hubbell, Mrs. G. R. Ward, Mrs. A. C. Brown, Mrs. C. H. Chase, Mrs. H. M. Lightener, Mrs. F. Fisher, Mrs. J. J. Hogarty, Mrs. R. A. Archibald, Miss Agnes Bell, Mrs. L. A. Covell, Mrs. C. W. Fisher, Miss Marie Rike, Miss Violet Lincoln, Mrs. T. W. Orme, Mrs. R. T. Whittlesey, Mrs. F. H. McNair, Mrs. S. J. Platt, Mrs. C. O. Butter, Mrs. Julius Kahn, Miss Hill, Mrs. W. A. Boucher, Mrs. Ward B. Rowland, Mrs. Otis A. Longley, Miss Gwendolyn Carpenter, Mrs. David F. Fox, Miss Ruth Moore, Miss Ethel V. Hogarty, Miss Jessie V. Berry, Mrs. Tom Carpenter, Mrs. G. Edwards Matthews, Mrs. L. A. Danielson, Mrs. Geo. J. Donnelly, Mrs. A. V. Hall, Mrs. Pancoast, Mrs. C. Sears, Mrs. A. P. Jacobs, Miss Howard, Mrs. P. H. Browning, Dr. P. S. Nusbaumer, Mrs. Charles Keane, Mrs. H. R. Jackson, Mrs. H. A. Spencer, Mrs. C. A. Dukes, Mrs. G. H. Beardsley, Mrs. C. E. Price, Miss Hazel Dell, Mrs. Chas Eastman.

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- CANADA—Miss Mary Stewart, Miss Annie Ryan.
COLORADO—Mrs. Geo. H. Glover, Mrs. B. F. Kaupp, Miss Madalin Kaupp.
CONNECTICUT—Mrs. Richard P. Lyman.
DISTRICT OF COLUMBIA—Mrs. John R. Mohler, Miss Miriam C. Mohler.
ILLINOIS—Mrs. James Robertson, Mrs. A. B. Ryan.
INDIANA—Mrs. Taylor.
IDAHO—Mrs. F. W. Chamberlain, Mrs. G. E. Noble.
IOWA—Mrs. G. A. Johnson.
KANSAS—Mrs. A. Plummer, Mrs. F. S. Schoenleber.
MINNESOTA—Mrs. F. A. Ilstrup.
MISSOURI—Mrs. F. F. Brown, Mrs. A. T. Kinsley, Mrs. J. H. Moser, Mrs. B. W. Murphy, Mrs. C. N. Scott, Mrs. S. Stewart,
MONTANA—Mrs. W. J. Taylor.
MICHIGAN—Mrs. S. Brenton, Mrs. J. S. Donald.
MASSACHUSETTS—Mrs. Francis Abele.
NEBRASKA—Mrs. J. L. Hoylman.
NEW YORK—Miss C. H. Faust, Mrs. R. W. Ellis, Mrs. J. H. Hickok.
NEVADA—Mrs. T. F. Richardson.
NEW ZEALAND—Mrs. F. J. Quick.
OHIO—Mrs. A. S. Cooley, Mrs. E. H. Shepard.
OREGON—Mrs. S. J. Carney, Mrs. A. C. Johnson.
PENNSYLVANIA—Mrs. C. J. Marshall, Mrs. W. H. Hoskins, Mrs. F. H. Schneider, Mrs. O. G. Noack, Mrs. H. B. Brooks.
TENNESSEE—Mrs. Geo. R. White.
UTAH—Mrs. J. H. Halton.
WASHINGTON—Mrs. A. W. Small, Mrs. S. B. Nelson, Mrs. J. T. Seely, Mrs. S. T. Miller.
WISCONSIN—Mrs. W. F. Eckert, Mrs. H. F. Eckert, Mrs. D. B. Clark.

NEW MEMBERS.

As a result of several sittings of the Executive Committee during the convention, 191 new names were recommended for election to membership and 5 for reinstatement; the final result being 196 names added to the roll of active members in the association as follows:

Allen, Rollin M., M.D.C., Rapid City, S. D. (Iowa State College, Chicago Veterinary College, 1903); Anders, Thomas O.,

D.V.M., Fresno, Cal. (Ohio State University, Vet. Department, 1903); Arnold, John W., M.D.V., Riverside, Cal. (McKillip Veterinary College, 1908); Babb, Geo. F., D.V.S., Topeka, Kan. (Kansas City Veterinary College, 1910); Baker, Eustace T., D.V.M., Spokane, Wash. (Ohio State University, 1909); Baker, George S., V.S., Berkeley, Cal. (Montreal, 1887); Baker, Horace Morgan, V.M.D., Sydney, N. S. W., Australia (Veterinary Department, University of Pennsylvania, 1908); Begeman, Philip F., D.V.M., Sanborn, Ind. (Indiana Veterinary College, 1908); Best, William Robt. Llewellyn, V.S., Manila, P. I. (Ontario Veterinary College, 1895); Bine, Henry E., D.V.S., Carrizozo, N. M. (Kansas City Veterinary College, 1908); Blackstock, Moore R., D.V.S., Gunnison, Col. (Colorado Agricultural College, Vet. Department, 1910); Boucher, W. A., Pasadena, Cal. (Ontario Veterinary College, 1901); Brenton, Willis L., V.S., Detroit, Mich (Ontario Veterinary College, 1903); Brossard, George J., V.S., Ashland, Wis. (Ontario Veterinary College, 1895); Brown, Arthur C., D.V.S., San Francisco, Cal. (Washington State College, 1908); Brown, Herbert Austen, M.D.C., Victoria, B. C. (Chicago Veterinary College, 1908); Burns, John Robert, D.V.M., Manila, P. I. (New York State Veterinary College, 1907); Carroll, Thomas E., D.V.S., Chico, Cal. (University of California, Vet. Department, 1899); Carstenson, Lawrence P., D.V.S., Columbus, Neb. (Kansas City Veterinary College, 1907); Cleveland, Walter J., D.V.M., Hornet, Neb. (Iowa State College, 1910); Cline, Jesse D., D.V.M., York, Neb. (Iowa State College, 1910); Close, Frank W., D.V.S., Spokane, Wash. (Washington State College, 1907); Closson, Gardner W., D.V.S., Anakeim, Cal. (Kansas City Veterinary College, 1905); Creech, G. Tinsley, D.V.S., Roswell, N. M. (Kansas City Veterinary College, 1910); Curry, Joseph Michael, V.S., B.V.Sc., Hartford, Conn. (Veterinary Department, Toronto University, 1910); Curtis, Wilbert A., D.V.S., San Fernando Pampanga, P. I. (Kansas City Veterinary College, 1909); Danielson, Leopold A., V.S., Madera, Cal. (New York College of Veterinary Surgeons, 1895); Davenport, Miles Leroy, D.V.M., Fergus Falls, Minn. (New York-American Veterinary College, 1903); Dawdy, Clarence A., M.D.C., Brawley, Cal. (Chicago Veterinary College, 1903); Dell, Jesse Applin, V.S., Los Angeles, Cal. (Ontario Veterinary College, 1881); Deming, Charles W., D.V.M., Spokane, Wash. (Iowa State College, 1900); DeSupa, John Alexander, D.V.S.,

Salinas, Cal. (San Francisco Veterinary College, 1910); Dickey, George W., V.S., Colorado Springs, Col. (Ontario Veterinary College, 1886); Dill, Bennie G., D.V.S., Reno, Nev. (Kansas City Veterinary College, 1908); Dillon, L. Ray, M.D.C., Portland Ore. (Chicago Veterinary College, 1906); Doak, Hugh T., D.V.S., Los Angeles, Cal. (Kansas City Veterinary College, 1905); Douglass, Frank J., V.M.D., New Orleans, La. (Indiana Veterinary College, 1906); Dreher, William Henry, M.D.C., Oregon, Wis. (Chicago Veterinary College, 1907); Durfee, Clarence A., V.S., San Luis Obispo, Cal. (New York College Veterinary Surgeons, 1895); Eagle, Alexander F., D.V.S., San Francisco, Cal. (Kansas City Veterinary College, 1906); Eisenhower, Elmer C., D.V.S., Gypsum, Kan. (Kansas City Veterinary College, 1910); Eisenhower, James M., D.V.S., Schell City, Mo. (Kansas City Veterinary College, 1910); Eliason, Oscar H., V.S., Omro, Wis. (Ontario Veterinary College, 1901); Ettling, Christian C., D.V.S., E. Las Vegas, N. M. (Kansas City Veterinary College, 1908); Farley, Abraham Jackson, A.B., D.V.S., Los Angeles, Cal. (Kansas City Veterinary College, 1904); Fleming, William B., Casper, Wyo. (American Veterinary College, 1894); Folse, Charles D., Marshall, Texas (Kansas City Veterinary College, 1910); Forge, Louis A., M.D.C., Burlington, Wis. (Chicago Veterinary College, 1903); Frank, John Williamson, V.S., Nelson, B. C. (Ontario Veterinary College, 1904); French, Alexander W., Laramie, Wyo. (Kansas City Veterinary College, 1909); French, William Harold, M.D.C., Redfield, S. D. (Chicago Veterinary College, 1909); Frey, Charles Thomas, River Point, R. I. (Ontario Veterinary College, 1899); Gearhart, Frank C., D.V.M., Iowa State College, 1907); Gilchrist, Wm. T., V.S., Norfolk, Va. (Ontario Veterinary College, 1888); Glynn, Lawrence R., D.V.S., Monte Vista, Col. (New York-American Veterinary College, 1908); Goodwin, Percy Walker, M.D.C., Newman, Cal. (Chicago Veterinary College, 1910); Gray, Frederick Sumner, M.D.C., Big Timber, Mont. (Chicago Veterinary College, 1909); Gress, John L., D.V.S., Manila, P. I. (Kansas City Veterinary College, 1908); Grove, John S., V.S., Kansas City, Kan. (Ontario Veterinary College, 1892); Haggard, E. W., V.S., Portland, Ore. (Ontario Veterinary College, 1888); Hallquist, Ralph August, D.V.S., Minneapolis, Minn. (Kansas City Veterinary College, 1909); Hammond, Harry James, D.V.M., Sacramento, Cal. (Ohio State University, Vet.

College, 1900); Handley, John M., Union Stock Yards, Chicago, Ill. (Ohio State University, 1908); Harmon, Arthur Atwell, V.M.D., Flagstaff, Ariz. (Veterinary Department, University of Pennsylvania, 1902); Harrison, James, V.S., Dalhart, Texas (Ontario Veterinary College, 1890); Hart, George H., V.M.D., Los Angeles, Cal. (University of Pennsylvania, 1903); Hartman, Thos. T., D.V.S., Manila, P.I. (Kansas City Veterinary College, 1909); Hatterscheid, Charles Albert, M.D.C., Aberdeen, S. D. (Chicago Veterinary College, 1903); Hay, Leopold, V.S., Faribault, Minn. (Ontario Veterinary College, 1896); Heacock, Clyde C., V.S., Chama, N. M. (Ohio Veterinary College, 1903); Hecker, Frank, M.D.C., Camden, Tenn. (Chicago Veterinary College, 1906); Hedrick, Horace A., D.V.S., Baltimore, Md. (American Veterinary College, 1892); Heminy, Christian D., V.S., New London, Wis. (Ontario Veterinary College, 1894); Herring, Lawrence James, D.V.S., Experiment, Ga. (Kansas City Veterinary College, 1909); Hess, Orlando B., D.V.S., Seattle, Wash. (National Veterinary College, 1894); Hicks, Hazen H., M.D.V., Sacramento, Cal. (Harvard University, 1889); Hill, Anson Harris, D.V.S., Brookings, S. D. (Kansas City Veterinary College, 1909); Hill, James, M.D.C., Tarlac Tarlac, P. I. (Chicago Veterinary College, 1900); Hill, James Anderson, M.D.C., Alameda, Cal. (Chicago Veterinary College, 1906); Hill, William Proctor, V.S., Fort Wm. McKinley, Regal, P. I. (Ontario Veterinary College, 1895); Hoskins, H. Preston, V.M.D., Philadelphia, Pa. (University of Pennsylvania, Veterinary Department, 1910); Howard, Julian, D.V.S., Spokane, Wash. (Washington State Veterinary College, 1909); Howard, William K., M.D.C., Manila, P. I. (Chicago Veterinary College, 1907); Hubbell, A. D., Los Angeles, Cal. (Chicago Veterinary College, 1906); Hudgins, Patrick Henry, V.S., B.V.Sc., Fredericksburg, Va. (Ontario Veterinary College, 1910); Humphrey, E. H., M.D.V., Santa Maria, Cal. (McKillip Veterinary College, 1905); Humphreys, John C., D.V.S., Laredo, Mo. (Kansas City Veterinary College, 1910); Hurst, Dan. W., D.V.M., Rapid City, S. D. (Iowa State College, 1908); Hurst, Wilbur H., D.V.M., Chadron, Neb. (Iowa State College, 1902); Husband, Aubrey G., M.D.V., V.S. (Ontario Veterinary College and McKillip, Ohio, 1906-07; Hylton, F. D., D.V.S., Las Animas, Col. (Veterinary Department, Colorado Agricultural College, 1910); Innes, Marion, D.V.M., Albuquerque, N. M. (Ohio State Uni-

versity, 1901); Jeffries, Joseph Richardson, V.M.D., Fort Riley, Kan. (University of Pennsylvania, 1893); Kalkus, Julius Wilbur, D.V.S., Pullman, Wash. (Kansas City Veterinary College, 1909); Kelpe, Henry O., D.V.S., Roswell, N. M. (Kansas City Veterinary College, 1909); Kingman, Harry Woodbridge, M.D.V., Boston, Mass. (McKillip Veterinary College, 1909); Kinsley, Christopher C., D.V.S., Oakley, Kan. (Kansas City Veterinary College, 1905); Kliphardt, Wm. A., D.V.S., Manila, P. I. (Kansas City Veterinary College, 1909); Knight, Ralph F., D.V.M., Machias, N. Y. (Cornell University, 1907); Korb Walter A., D.V.S., Tagbilaran Bohol, P. I. (Kansas City Veterinary College, 1908); Kragniss, Theodore Andrew, Chicago, Ill. (McKillip Veterinary College, 1901); Kron, Oscar Jacob, San Francisco, Cal. (New York-American Veterinary College, 1907); Lawton, Andrew N., Brodhead, Wis. (Ontario Veterinary College, 1905); Le Claire, Thomas E., D.V.S., High River, Alberta (Laval University, Montreal, 1890); Leslie, Charles Adelphus, V.S., Deadwood, S. D. (Ontario Veterinary College, 1903); Lichtenwalter, Harry W. C., V.S., San Francisco, Cal. (Ohio State University, 1908); Lipp, George A., V.S., Roswell, N. M. (Ohio State University, 1904); Love, James R., D.V.M., Lockwood, Ohio (Ohio State University, 1907); Low, Edward, Sacramento, Cal. (McKillip Veterinary College, 1908); Lytle, William Harrison, D.V.M., Pendleton, Ore. (Veterinary Department, Iowa State College, 1902); McCarthy, Thomas A., D.V.M., Santa Fe, N. M. (New York State Veterinary College, 1906); McClain, L. Gordon, D.V.S., Lamar, Col. (Colorado Agricultural College, 1910); McCullough, M.D.C., Delavan, Wis. (Chicago Veterinary College, 1894); McDowell, Clarence, V.S., Watertown, S. D. (Ontario Veterinary College, 1904); McHenry, Walter, V.M.D., Waterloo, Iowa (University of Pennsylvania, 1908); McKeon, William Joseph, M.D.C., Victoria, B. C. (Chicago Veterinary College, 1910); McKibbin, David, Jr., V.M.D., Baguio Benguet, P. I. (University of Pennsylvania, 1906); McKinney, William J., V.S., Brooklyn, N. Y. (New York College of Veterinary Surgeons, 1889); McKinnon, John Alexander, V.S., Manila, P. I. (Ontario Veterinary College, 1897); McMullin, Robert H., M.D.C., Denver, Col. (Chicago Veterinary College, 1892); MacKellar, Robt. S., V.S., New York City (New York College of Veterinary Surgeons, 1894); Marquardt, Samuel Jacob, D.V.M., Ft. Wayne, Ind. (Ohio State University, Vet. Dept., 1904); Mebane, William

Long, V.M.D., St. Albans, Me. (University of Pennsylvania, Veterinary Department, 1908); Megouay, Claude L., V.S., Sacramento, Cal. (Ontario Veterinary College, 1895); Meyerhoeffer, Jos. Stewart, V.S., North River, Va. (Ohio State University, 1910); Moore, Sheard, V.S., Donaldsonville, La. (Ontario Veterinary College, 1896); Nance, Joseph E., D.V.S., Iloilo, P. I. (Kansas City Veterinary College, 1907); Naylor, Ralph Edelen, D.V.S., Chadron, Neb. (Kansas City Veterinary College, 1907); Newberg, Louis, D.V.S., Kansas City, Mo. (Kansas City Veterinary College, 1910); O'Banion, Archie L., D.V.M., Santa Barbara, Cal. (Iowa State College, 1907); O'Brien, Patrick Jos., M.R.C.V.S., Los Angeles, Cal. (Royal Veterinary College, London, 1907); O'Donnell, Michael J., M.D.V., Blue Island, Ill. (McKillip Veterinary College, 1900); O'Reilley, James M., M.D.C., Merrill, Wis. (Chicago Veterinary College, 1898); Oliver, Walter Gordon, M.D.V., San Diego, Cal. (McKillip Veterinary College, 1908); Orme, Frank W., M.D.V., San Francis, Cal. (McKillip Veterinary College, 1908); Orme, Thomas Whitfield, V.S., San Bernardino, Cal. (Ontario Veterinary College, 1893); Palmer, Floyd Elbert, M.D.C., Alexandria, Minn. (Chicago Veterinary College, 1910); Paxton, Irving B., D.V.M., Red Bluff, Cal. (State College of Iowa, 1905); Peck, Sanford Artisan, D.V.S., Oak Grove, Mo. (Kansas City Veterinary College, 1904); Perry, James G., D.V.S., Carrizozo, N. M. (Kansas City Veterinary College, 1909); Pfarr, Albert William, V.S., B.V.Sc., Pittsburgh, Pa. (Ontario Veterinary College, 1908-1910); Pike, Frederick, V.S., Spokane, Wash. (Ontario Veterinary College, 1886); Pollard, John Samuel, V.S., Providence, R. I. (Ontario Veterinary College, 1898); Purcell, John T., Rapid City, S. D. (McKillip Veterinary College, 1907); Prien, Roland H., M.D.V., Laramie, Wyo. (McKillip Veterinary College, 1910); Priest, Benjamin H., M.D.C., Kern City, Cal. (Chicago Veterinary College, 1907); Pritchard, William T., D.V.S., North Platte, Neb. (Kansas City Veterinary College, 1907); Quin, Abner H., V.S., Creston, Iowa (Ontario Veterinary College, 1888); Quinn, Thomas F., V.S., M.D.C., Greeley, Col. (Chicago Veterinary College, 1904); Raque, Charles A., D.V.S., San Luis Obispo, Cal. (American Veterinary College, 1893); Reardon, John D., M.D.V., Manila, P. I. (McKillip Veterinary College, 1909); Revercomb, George A., D.V.S., Clifton Forge, Va. (Kansas City Veterinary College, 1905); Richardson, T.

Francis, B.S., D.V.S., Lallon, Nev. (Washington State College, 1907); Reitz, J. H., D.V.M., Denver, Col. (Ohio State University, 1903); Rishel, Albert E., M.D.C., Hollywood, Cal. (Chicago Veterinary College, 1889); Roach, Frank, Pendleton, Ore. (San Francisco Veterinary College, 1910); Robinson, Beale, A., V.S., Independence, Kan. (Ontario Veterinary College, 1900); Rosenberger, Arthur C., D.V.S., Sacramento, Cal. (Washington State College, 1908); Royer, Bertsch, V.S., Shawano, Wis. (Ontario Veterinary College, 1898); Runge, Werner, Newark, N. J. (Certificate Royal Veterinary School of Berlin, Germany, 1879); Savage, Willard A., M.D.C., Tucumcari, N. M. (Chicago Veterinary College, 1895); Sayre, B. H., South Omaha, Neb. (Kansas City Veterinary College, 1908); Seely, James Taintor, M.D.C., Seattle, Wash. (Chicago Veterinary College, 1908); Shaffer, Dallas W., M.D.V., New Castle, Pa. (McKillip Veterinary College, 1909); Shipley, Trajan A., M.D.C., St. Joseph, Mo. (Chicago Veterinary College, 1890); Smith, Stanley, V.S., Columbia, Mo. (New York College of Veterinary Surgeons, 1892); Snyder, Rudolph, M.D.C., Lamar, Col. (Chicago Veterinary College, 1903); Sorensen, Andreas Iversen, V.S., Modesto, Cal. (Ontario Veterinary College, 1898); Sorrell, Warren, D.V.S., Willard, N. M. (Kansas City Veterinary College, 1907); Spenser, H. H., M.D.C., Jacksonville, Fla. (Chicago Veterinary College, 1906); Springer, Samuel E., V.S., Denver, Col. (Ohio State Veterinary College, 1904); Stiner, Javan O., D.V.S., Cedarville, Cal. (Kansas City Veterinary College, 1910); Streets, John James, D.V.S., Ventura, Cal. (American Veterinary College, 1888); Stults, Clinton L., D.V.S., Tucumcari, N. M. (Kansas City Veterinary College, 1907); Sullivan, James, V.S., Portland, Ore. (Ontario Veterinary College, 1887); Thompson, John S., V.S., Moscow, Idaho (Ontario Veterinary College, 1892); Thompson, Warwick Morrill, Red Bluff, Cal. (Ontario Veterinary College, 1872); Thomson, Charles Goff, D.V.M., Manila, P. I. (New York State Veterinary College, 1907); Tooley, James W., V.S., Fon du Lac, Wis. (Ontario Veterinary College, 1896); Turner, H. A., Pleasantine, Cal. (Ontario Veterinary College, 1894); Van Eenenaam, John, M.D.V., Salem, S. D. (McKillip Veterinary College, 1909); Walsh, Charles I., D.V.S., St. Joseph, Mo. (Kansas City Veterinary College, 1908); Walters, Percy Knight, V.S., Okotoks, Alberta, Canada (Ontario Veterinary College, 1905); White, Stephen Alban Keen, V.S., Vancouver, B. C.

(Ontario Veterinary College, 1900); Wiley, Morris C., D.V.S., Albuquerque, N. M. (McGill University, Veterinary Department, 1893); Wilson, Fred O., V.S., Green Bay, Wis. (Ontario Veterinary College, 1895); Wilson, J. Oscar, D.V.M., Pendleton, Ore. (Ohio State University, 1908); Wipf, J. D. C., M.D.V., Belgrade, Mont. (McKillip Veterinary College, 1909); Wurm, John E., V.S., Pigeon, Mich. (Ontario Veterinary College, 1902); Youngberg, Stanton, D.V.M., Manila, P. I. (Veterinary Department, Ohio State University, 1907).

REINSTATED.

Faville, Geo. C., D.V.M., Norfolk, Va. (Iowa State College, 1880); Flower, E. Pegram, D.V.S., Baton Rouge, La. (United States College of Veterinary Surgeons, 1899); Sawyer, Frank N., M.D.C., Bakersfield, Cal. (Chicago Veterinary College, 1893); Spencer H. Francis, D.V.S., Santa Barbara, Cal. (Chicago Veterinary College, 1891); Stevenson, James Alston, V.S., Gretna, Manitoba, Canada (Ontario Veterinary College, 1894).

HONOR ROLL.

The following names were added to the honor roll: W. G. Hollingworth, J. W. Scheibler and W. L. Williams.

CABLEGRAMS.

“ Paris, September 6, 1910.

“ President, Veterinary Association, Palace Hotel, San Francisco.

“ Always with you. Friendly greetings. Best wishes.

“ LIAUTARD.”

A telegram expressing regret at his inability to be present, and wishing the association a successful meeting, was received from ex-President Dalrymple, Baton Rouge, La.

SECRETARY'S REPORT.

As Secretary Lyman's report will appear in detail in the published proceedings of the Association, we will not use the much-needed space to reproduce it here; but desire to compliment that

efficient retiring officer on its completeness, although presented in so concise a form, a feature which has characterized the Doctor's work during his several years' service to the Association.

TREASURER'S REPORT.

RECEIPTS FOR 1909-10.

1909.

September 11—Balance in bank at last report.....	\$ 2,033 09
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1910.	
January 29—Received from R. P. Lyman, Secretary.....	1,200 00
June 10—Received from R. P. Lyman, Secretary.....	500 00
July 20—Received from R. P. Lyman, Secretary.....	500 00
August 21—Received from R. P. Lyman, Secretary.....	2,001 37
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Total receipts	\$ 6,234 46

DISBURSEMENTS FOR 1909-10.

1909.

September 25—To R. P. Lyman, Kansas City, Mo., for salary and expenses at Chicago meeting.....	\$ 604 28
September 25—To J. B. Lippincott Co., Philadelphia, Pa., for balance of bill ordered paid by Executive Committee.....	100 00
September 25—To Wm. Henry Kelley, Albany, N. Y., for expenses as Resident State Secretary.....	26 75
September 25—To B. T. Woodward, Washington, D. C., for expenses as Resident Secretary.....	1 08
September 25—To Charles A. McKim, Norfolk, Neb., for expenses as Resident Secretary.....	5 50
September 25—To C. H. Jewell, Fort Riley, Kansas, for expenses as Resident Secretary.....	55
September 25—To J. W. Parker, El Paso, Texas, for expenses as Resident Secretary.....	4 55
September 25—To J. F. Mack, River Falls, Wis., for expenses as Resident Secretary	9 96
September 25—To J. P. Foster, Huron, S. D., for expenses as Resident Secretary	4 00
September 25—To W. Dean Wright, Portland, Oregon, for expenses as Resident Secretary	90
September 25—To A. T. Kinsley, Kansas City, Mo., for expenses as Acting Resident Secretary	2 00
September 25—To M. F. Leffingwell, Austin, Minn., for expenses as Resident Secretary	4 00
September 25—To W. H. Dalrymple, Baton Rouge, La., for express on Certificates from Philadelphia.....	35
September 25—To Homer Miller, Paragon, Ind., for membership fees returned (application withdrawn).....	8 00
September 25—To R. R. Hammond, Cherokee, Ia., for expenses as Resident Secretary.....	8 45
September 25—To Wm. Herbert Lowe, Paterson, N. J., for telegram to W. H. Dalrymple.....	60

September 25—To Thomas Thacker, Renfrew, Ont., for expenses as Resident Secretary.....	8 63
September 25—To Geo. R. White, Nashville, Tenn., for expenses as Treasurer to September 1, 1909.....	4 50
October 22—To The Case, Lockwood & Brainard Co., Hartford, Conn., for printing by R. P. Lyman, Secretary.....	391 37
October 22—To J. Arthur Goodwin, New Iberia, La., for expenses as Resident Secretary.....	2 00
October 22—To Mark White, Denver, Colo., for expenses as Resident Secretary	5 00
October 22—To American Surety Company, New York, N. Y., for Treasurer's bond	10 00
November 1—To C. J. Marshall, Philadelphia, for floral design for Dr. Leonard Pearson.....	10 00
November 1—To R. Fred Eagle, Kansas City, Kan., for expenses as Resident Secretary	5 35
November 1—To Fred Elray Jones, Rochelle, Ill., for fees and dues returned	8 00
November 1—To Andrew J. Kyle, Cozad, Neb., for fees and dues returned	8 00
November 1—To William Henry Lynch, Portland, Oregon, for fees and dues returned.....	8 00
November 1—To W. W. Parkinson, Mt. Carroll, Ill., for fees and dues returned	8 00
November 1—To Alva B. Carter, Covington, Ind., for fees and dues returned	8 00
November 1—To R. W. English, Jersey City, N. J., for fees and dues returned	8 00
November 1—To Chas. F. Roberts, New Haven, Conn., for services as reporter, Chicago meeting.....	198 25
December 20—To A. D. Melvin, Washington, D. C., for telegrams, postage and expressage.....	3 81
December 20—To W. A. Myers, Winona, Ill., for fees returned..	8 00
December 20—To John W. Spence, Philadelphia, for printing, stationery, etc.	13 50
December 20—To T. E. Robinson, Westerly, R. I., for postage as Resident Secretary.....	1 00

1910.

February 1—To Bryant & Douglass Book & Stationery Co., Kansas City, Mo., for letter heads, circular letters, etc.....	88 10
February 16—To R. A. Phillips, Oklahoma City, Okla., for expenses as Resident Secretary, 1909.....	1 00
February 16—To H. M. Gohn, St. John, Mich., for expenses as Resident Secretary, 1908-09.....	1 25
February 16—To A. H. Baker, Chicago, Ill., for postage in mailing literature to prospective members.....	7 50
February 16—To Samuel D. Holt, Philadelphia, Pa., for engrossing certificates of membership.....	75 05
February 28—To Bryant & Douglass Book & Stationery Co., Kansas City, Mo., for printing by R. P. Lyman, Secretary.....	127 00
March 19—To C. J. Marshall, Philadelphia, Pa., for expenses as Chairman Publication Committee.....	82 50
May 13—To R. P. Lyman, Kansas City, Mo., for telegrams, postage, expressage, etc.....	74 43
June 1—To J. B. Lippincott Co., Philadelphia, Pa., for printing and distributing proceedings Chicago meeting.....	1,586 33

July 8—To Bryant & Douglass, Kansas City, Mo., for printing letter heads, bill heads and circulars, by R. P. Lyman, Secretary	37 25
August 18—To R. P. Lyman, Secretary, Hartford, Conn., for type-writing, postage and office supplies.....	59 61
August 18—To Case, Lockwood & Brainard Co., Hartford, Conn., for printing letter heads, envelopes and circulars by R. P. Lyman, Secretary	72 10
August 18—To G. W. Clark, Marinette, Wis., for expenses as Resident Secretary	6 75
August 18—To A. D. Melvin, Washington, D. C., for postage and telegram	1 59
Total expenditures 1909-10.....	\$ 3,710 84

DISBURSEMENTS BY THE INTERNATIONAL TUBERCULOSIS COMMISSION.

1910

April 19—To A. J. Tupa, St. Paul, Minn., for typewriting for Tuberculosis Commission	\$ 3 10
April 19—To M. H. Reynolds, St. Paul, Minn., for expenses attending meeting Tuberculosis Commission.....	6 00
July 8—To Volkszeitung Job Printing Co., St. Paul, Minn., for printing for Tuberculosis Commission.....	22 65
July 8—To M. H. Reynolds, St. Paul, Minn., for postage stamps for Tuberculosis Commission.....	5 00
August 11—To C. H. Sharman, Ottawa, Canada, for reporting meeting, stenciling, typewriting, etc., for International Tuberculosis Commission	100 00
August 11—To Miss B. Drummond, Ottawa, Canada, for type-writing, stenciling, etc., for International Tuberculosis Commission	25 00
August 11—To Miss D. St. George, Ottawa, Canada, for type-writing, stenciling, etc., for International Tuberculosis Commission	25 00
August 11—To Western Union Telegraph Co., Minneapolis, Minn, for telegrams for International Tuberculosis Commission... .	4 40
Total expenditures	\$ 191 15

Grand total disbursements.....	\$ 3,901 99
Balance in bank.....	2,332 47

A glance at the foregoing financial statement will satisfy the most exacting that the officers of the American Veterinary Medical Association have conducted the affairs of the organization economically, and since no complaint has been registered we are justified in concluding that our business dealings have been entirely satisfactory to all parties concerned. All of our financial obligations have been met promptly. We have not defaulted in the payment of a single account against us, and our credit for any reasonable amount is to-day unquestioned. It must be re-

membered that our credit has been maintained and the large bank balance accumulated—directly contrary to the predictions of some—with the annual dues at the low figure of three dollars. Our total expenditures during the past year have been \$3,901.99. This exceeds the expenditures of the previous year by \$1,410.71, while our total receipts have been \$6,234.46, an excess over the receipts for the previous year of \$1,710.09; hence it is a fact that our bank balance at this time exceeds our bank balance of one year ago by \$299.38. It may become necessary in the course of time to raise the amount of the annual dues, but in the opinion of your Treasurer it is not desirable at the present. I desire to most heartily thank the several officers and all the members with whom I have had official business for their uniform courtesy and co-operation, which has made it a real pleasure to serve the Association in the capacity of Treasurer.

GEORGE R. WHITE, Treasurer.

San Francisco, September 6, 1910.

To the Finance Committee of the American Veterinary Medical Association:

GENTLEMEN—This certifies that Geo. R. White, Treasurer, has on deposit with the State Trust Company, to the credit of the American Veterinary Medical Association, two thousand three hundred and thirty-two and forty-seven hundredths dollars (\$2,332.47).

EDGAR MAGNESS, President.

Nashville, Tenn., August 27, 1910.

REPORTS OF COMMITTEES.

REPORT OF THE COMMITTEE ON DISEASES.

Mr. President and Members of the Association:

The Committee on Diseases have the good fortune to report that during the past year our country has not been visited by any new or unusual epizootic disease. This freedom from maladies so liable to be imported to our shores emphasizes the efficiency of the Federal Veterinary departments in both the United States and Canada. Further, there has not been recorded any severe outbreak of diseases indigenous to our country that have been heretofore introduced. This indicates the great care that has been taken by those having in hand the live stock sanitation

and control of infectious diseases in our respective states and provinces.

Investigations into the nature of animal diseases and their methods of control have been more active than heretofore. The solution of the unsolved problems relative to glanders, rabies, infectious abortion, dourine, infectious anemia in horses, lip and leg ulceration, granular venereal disease of cattle, together with other maladies, will require long and repeated investigations. Meantime the profession as well as the animal owners must be patient, for "application cannot go ahead of the knowledge to be applied."

At the last meeting of the association, the Committee on Diseases recommended that a committee be appointed to formulate methods for the control of bovine tuberculosis and to report at this meeting. The association did much more than this and by resolution authorized the appointment of an International Commission to consider the subject. As the members of the Committee on Diseases were selected from the members of the Commission, it was decided that the greatest service the committee could render the association would be a series of individual papers discussing somewhat in detail various phases of animal tuberculosis and its control that could not be dealt with at length in the report of the commission. To that end the individual members of the committee will present the following papers as a part of this report:

(a) "Some Methods Employed in Europe to Control Bovine Tuberculosis,"⁵ Dr. V. A. Moore.

(b) "Open Air Experiment with Tuberculous Cattle," Dr. J. G. Rutherford.

(c) "Immunization of Cattle Against Tuberculosis," Drs. J. R. Mohler and E. C. Schroeder.

(d) "Legislation on Bovine Tuberculosis," Dr. M. H. Reynolds.

The new discoveries in connection with many questions in general pathology, together with the recent findings relative to vaccine treatments, are signals for ever increasing activity on the part of the practitioner.

Respectfully submitted,

V. A. MOORE, Chairman.

JOHN R. MOHLER.

M. H. REYNOLDS.

E. C. SCHROEDER.

J. G. RUTHERFORD.

REPORT OF THE INTERNATIONAL COMMISSION ON THE CONTROL
OF BOVINE TUBERCULOSIS.

To the President of the American Veterinary Medical Association:

Owing to the great economic and sanitary significance of animal tuberculosis to the live stock industry of America, and the many and varied factors which must of necessity be accounted with in formulating successful measures for its eradication, the American Veterinary Medical Association, at its meeting in Chicago in September, 1909, appointed the International Commission on the Control of Bovine Tuberculosis. The Commission was instructed to study the problem of tuberculosis among cattle and to report at the next meeting of the association upon reasonable and economically practicable methods or systems to be recommended to both officials and live stock owners for eradicating this great scourge of domesticated animals.

It is recognized that tuberculosis is widely prevalent among cattle and other animals and that the frequency with which this great evil occurs is increasing rather than declining. As tuberculosis is one of the strictly preventable infections, there is good ground for the belief that through the formulation and enforcement of proper regulations the disease may eventually be entirely suppressed.

The Commission has held four meetings as follows: Buffalo, N. Y., December 13 and 14, 1909; Detroit, Mich., March 1 and 2, 1910; Ottawa, Canada, May 19, 20 and 21, 1910; Madison, Wis., June 27 and 28, 1910, all of which were well attended, very few of the members having on any occasion been absent. The Commission begs to present as a result of its labors the following report which, although brief, will, on examination, be found to comprise the principal points essential to the promulgation of a comprehensive and practical policy, such as may reasonably be adopted by any governmental body interested in the control of bovine tuberculosis.

It is quite unnecessary in view of the extensive knowledge already possessed by all who are familiar with the efforts which have hitherto been made to secure control of bovine tuberculosis, to dwell at any length upon the importance of the subject or upon the conditions which led to the formation of the Commission.

In view of the personnel of the Commission as selected by the American Veterinary Medical Association, and of the fact

that so much information on the subject has been made available through the work of similar bodies in other countries, and the researches of scientific and practical men in America and elsewhere, the Commission has not deemed it necessary to take any evidence either from expert witnesses or others.

The members fully understood that the purpose which their appointment was intended to serve was less the acquisition of new knowledge regarding bovine tuberculosis than the careful study of the knowledge already available, and of the thoughts and opinions of those most entitled to speak with authority on the subject.

The conclusions reached in this report are, therefore, simply the outcome of an earnest and thoughtful consideration of the various modern aspects and phases of the problem, with the object of crystallizing public opinion and so clearing the way for legislative action.

They realized also that they could deal with fundamental principles only, and that the details of any policy which they might outline must in each case be worked out by the duly authorized and responsible representatives of the community immediately concerned.

They nevertheless deemed it essential to study closely the history of the various efforts hitherto made by such countries throughout the world as have attempted to legislate on the subject.

This naturally led to the gradual elimination of all methods other than such as might reasonably be adopted by any community desiring, in the full light of present day knowledge, to undertake the control of bovine tuberculosis.

It was felt, in view of the prevalence of the disease, especially in some localities and among certain classes of cattle, the difficulty of providing a sufficient number of trained officials and the large economic questions involved, to say nothing of the enormous expenditure, that it would be unwise for the present at least, to seriously discuss a policy of universal compulsory testing and slaughter.

Such a policy might perhaps be adopted with advantage by a small community, or one in which the disease existed to a very limited extent, but speaking generally, especially in view of past experiences in this line, it was thought better to omit it entirely from the recommendations of the Commission.

All other methods of dealing with bovine tuberculosis which have been recommended or tried in various communities, were thoroughly discussed, with the object of discarding weak points and adopting such features as might be deemed worthy of a place in the official findings of the Commission.

Every phase of the subject was in this way fully and freely considered, it being thought best to cover the whole ground as completely as possible before coming to a definite decision on any one point.

In order to still further minimize the risk of omitting from the deliberations of the Commission any phase of the question, four committees were appointed at the first meeting to deal respectively with :

- (1) Education and legislation.
- (2) Location of tuberculosis.
- (3) Dissemination,
- (4) Disposition of tuberculous animals.

The appointment of these committees proved to be of the greatest possible value in concentrating the energies of the various members on those branches of the subject with which they were most familiar, and their reports presented at subsequent meetings enabled the Commission to reach satisfactory conclusions much more rapidly than would otherwise have been the case.

As a means of furnishing information as to the reasons for these conclusions and the manner in which they were reached, the Commission would recommend that the reports of the committees should be published as an appendix to this report.

The Commission recognizing after careful study that the tuberculin test is the fundamental factor in any policy having for its object the control of bovine tuberculosis, decided that a pronouncement to that effect should properly occupy a foremost place.

Based on the information contained in the reports of its committees and on such other information as was brought out in the general discussions of the Commission, the following resolutions were adopted for presentation to the American Veterinary Medical Association.

Resolution 1—Dissemination.

As a general policy to be observed all contact between tuberculous and healthy cattle and between healthy cattle and stables,

cars, etc., which may contain living tubercle bacilli should be prevented. To accomplish this the following specific recommendations are made:

1. There should be no sale or exchange of animals affected with tuberculosis except for immediate slaughter or for breeding purposes under official supervision.
2. That the managements of live stock shows should give preference to cattle known to be free from tuberculosis, either by providing special classes for such cattle or in some other practical way, and should also take every precaution to prevent contact between such animals and those not known to be free from disease.
3. All live stock shippers should take every precaution to see that cars furnished are thoroughly cleansed and disinfected before use.

Resolution 2—Tuberculin Test.

1. That tuberculin, properly used, is an accurate and reliable diagnostic agent for the detection of active tuberculosis.
2. That tuberculin may not produce a reaction under the following conditions:
 - (a) When the disease is in a period of incubation.
 - (b) When the progress of the disease is arrested.
 - (c) When the disease is extensively generalized.

The last condition is relatively rare and may usually be detected by physical examination.

3. On account of the period of incubation and the fact that arrested cases may sooner or later become active, all exposed animals should be retested at intervals of six months to one year.
4. That the tuberculin test should not be applied to any animal having a temperature higher than normal.
5. That any animal having given one distinct reaction to tuberculin should thereafter be regarded as tuberculous.
6. That the subcutaneous injection of tuberculin is the only method of using tuberculin for the detection of tuberculosis in cattle which can be recommended at the present time.
7. That tuberculin has no injurious effect on healthy cattle.

Resolution 3—Evidence from Tuberculin Test.

That a positive reaction to tuberculin in any properly conducted test, official or otherwise, in any animal in any herd, shall be considered evidence sufficient upon which to declare the herd to be infected.

Resolution 4—Compulsory Notification.

That this Commission recommends the passage of legislation providing for the compulsory notification by owners and by veterinarians of the existence of tuberculosis in a herd whether such existence be made known by detection of clinical cases or by the tuberculin test.

Resolution 5—Location Through Slaughter.

This Commission recognizes that the discovery of tuberculosis in animals slaughtered for food purposes furnishes one of the best possible means of locating the disease on the farm, and therefore recommends the adoption of some system of marking, for purposes of identification, all cattle three years old and over, shipped for slaughter.

As tuberculosis of hogs is almost invariably due to bovine infection, this recommendation should also be made to apply to hogs of any age shipped for slaughter.

It is further recommended that the discovery of tuberculosis in animals coming under Government Inspection should be used whenever identification is possible, as a means of locating infected herds and premises. All such cases should be reported to the proper authorities for control action.

Resolution 6—Disposition of Tuberculous Animals; the Commission Plan.

i. As a general policy in the eradication of tuberculosis the separation of healthy and diseased animals, and the construction of a healthy herd are recommended.

In order to accomplish this, the following recommendations are made:

(1) If the herd is found to be extensively infected, as shown by the tuberculin test or clinical examination, even the apparently healthy animals in it should be regarded with suspicion, until they have been separated from the reacting animals for at least three months.

If after the expiration of this time they do not react to the tuberculin test, they may be considered healthy and dealt with accordingly.

It is recommended that a herd extensively infected should not be treated by the method of general separation, but that the construction of a new herd from the offspring only is advisable.

(2) If the herd is found by either or both of the above methods, to contain a relatively small proportion of diseased animals, separation of the diseased animals from the healthy animals, and the construction of a sound herd from the healthy animals, and the offspring of both, is advocated.

As a working basis in carrying out these principles we advise:

(a) That herds containing 50 per cent. or more of diseased animals be treated as coming under Section 1.

(b) That herds containing under 15 per cent. of diseased animals be treated as coming under Section 2.

(c) That herds falling between these figures be graded according to the option of the owner.

(d) That it shall be the prerogative of the owner to reject either plan and have his herd dealt with by removal and slaughter of diseased animals, with or without compensation, according to the public policy in operation.

2. That when by any means the officials properly charged with the control of tuberculosis become aware of its existence in a herd to which a policy of slaughter and compensation cannot reasonably be applied, such herd must be dealt with by the owner, under government supervision, on the principle of the separation of all sound animals from those affected. Such separation must be effected by treating the whole herd as diseased, and rearing the calves separately, either on Pasteurized milk or the milk of healthy cows, or when the number of those affected is so small as to warrant such a course, by the application to the whole herd, from time to time, under official supervision, of the tuberculin test, and the entire segregation of all animals found to react.

In the event of any owner refusing or neglecting to adopt either of the above methods, his entire herd to be closely quarantined, and sales therefrom to be entirely prohibited.

3. That a policy of compensation be recommended as useful and usually necessary as a temporary measure.

4. That, when slaughter is necessary, in order to avoid economic loss, every effort should be made to utilize as far as possible the meat of such animals as may be found fit for food on being slaughtered under competent inspection.

5. The details of the Commission Plan will be found fully set forth in the Appendix to this report.

Resolution 7—Prevention.

1. That, with the object of preventing the spread of infection, persons buying cattle for breeding purposes or milk pro-

duction should, except when such purchases are made from disease-free herds which have been tested by a properly qualified person, purchase only subject to the tuberculin test. In order to assist in the proper carrying out of this suggestion, the Commission recommends that official authorities should adopt such regulations as will prevent the entry to their respective territories of cattle for breeding purposes or milk production unless accompanied by satisfactory tuberculin test charts.

2. That all milk and milk by-products used as food should be properly Pasteurized unless derived from cows known to be free from tuberculosis.

Resolution 8—Control of Tuberculin Test.

That this Commission recommends the passage of legislation which will prevent the sale, distribution or use of tuberculin by any persons other than those acting with the full knowledge, or under the direction of official authorities.

Resolution 9—Education.

As a clear knowledge of the cause and character of tuberculosis among animals, the modes of dissemination, its significance as an economic and as a public health problem, underlie an intelligent adherence to the principles that must be observed in all efforts for eradication, as well as the establishment of proper co-operation in the great work between physicians, veterinarians, live stock owners, legislators, and the public generally, it is recommended that a widespread campaign of education be undertaken. To accomplish this end it is recommended that first of all a simple pamphlet on bovine tuberculosis be written, in which the language used shall be of such character that every person of average intelligence shall be able to read it without being mystified by technical terms or phrases. This pamphlet should be published with the endorsement of the American Veterinary Medical Association and the special endorsement and consequent authority of the International Commission on Bovine Tuberculosis Control.

Resolution 10—Publicity.

In concluding its work the Commission desires to especially appeal to the press, metropolitan, agricultural and local, to join

in the work of extending as much as possible among the people the conclusions here arrived at. The vital importance of the life of farm animals to the welfare of all classes of society needs no argument in its support. The aim and sole purpose which has actuated this Commission has been to arrive at the soundest conclusions possible in the light of the best knowledge obtainable.

Resolution 11—Legislation.

It is recommended that legislation regarding the control and eradication of tuberculosis among domestic animals be made uniform; that the laws of the United States and Canada and other American countries for the admission into America of animals from without be made stringent and as much alike as possible; and that the laws governing the interstate and interprovincial movement of cattle and that between different American countries be harmonized.

The laws governing interstate and interprovincial movement of cattle should be of such character that every state and every province will be free in its eradication work from unnecessary difficulties due to the existence of the disease in other states and provinces.

Legislation is especially required to prevent the various frauds which interfere with the satisfactory use of tuberculin as a diagnostic agent for tuberculosis, as well as for official supervision over all tuberculin sold to be used by veterinarians and others.

Resolution 12—Sanitation.

In the eradication of tuberculosis it should be kept in mind that, in addition to protecting animals against exposure to tubercle bacilli, it is desirable to make them as resistant to infection as possible. This can be done by stabling them in clean, disinfected and properly ventilated and lighted barns, giving them abundant clean water and nutritious food, a sufficient amount of daily exercise in the open air, and attending generally to those conditions which are well known to contribute to the health of animals.

The daily removal of manure from stables and water-tight floors and good drainage in stables are urgently recommended.

Young stock particularly should be raised as hardy as possible and should be accustomed to liberal exercise and living in the open.

Resolution 13—Immunization.

That as none of the various methods for the immunization of animals against tuberculosis have passed sufficiently beyond the experimental stage, the Commission is unable to endorse any of these for practical use at the present time.

Resolution 14—Animal Tuberculosis and Public Health.

While the members recognize that the subject with which this Commission is primarily intended to deal is the control and eradication of tuberculosis among animals as an economic problem, they cannot feel satisfied without declaring their recognition of the fact that tuberculosis among animals is also an important public health problem. Considered as such, the eradication of tuberculosis among animals should have the approval and support of all those persons who are interested in curtailing human suffering and prolonging human life.

Resolution 15—General Statement.

The members of the Commission wish it to be clearly understood that they recognize the limitations of a report necessarily based on actual and not on theoretical conditions. They fully realize that in the event of the policy of which their recommendations form the framework, being anywhere adopted even in its entirety, much greater benefit will be derived, at least for some time, from its educative than from its executive features.

The control to say nothing of the eradication of bovine tuberculosis, is impossible of achievement without the hearty co-operation of the men who are actually engaged in the cattle industry. In order to secure this co-operation, it will doubtless be necessary, in most committees, to carry on an active and prolonged educational campaign.

It is apparent that in the dissemination of practical and reliable information regarding the disease, it will be possible to employ a very large variety of methods. Many of these methods, such as bulletins, lectures and actual demonstrations of disease, having already been found valuable, will doubtless continue to be largely used.

It must not be forgotten, however, that in this, as in any other educative process, a measure of disciplinary control is essential to success.

Needless to say such control can be secured only by the passage of legislation which, while clear and comprehensive must, at

the same time, be sufficiently conservative to avoid exciting alarm or arousing antagonism on the part of owners especially of valuable herds.

The best law ever framed can be made an utter failure by stupid or injudicious administration, while, on the other hand, the most drastic legislation can be rendered acceptable if enforced with reasonable tact and diplomacy.

Provided, therefore, that these qualities, combined with integrity, thoroughness and determination, are available for administrative purposes, the members of the Commission are convinced that the enforcement of a law based on their recommendations will prove to be by far the most powerful and effective educational agency which could possibly be employed.

In concluding its report, the Commission would suggest that the association should make such provisions as may be necessary to carry on the work either by continuing the Commission as at present constituted, or with such changes in the personnel as may be considered desirable.

(Signed)

W. C. EDWARDS.	C. A. HODGETTE.	M. P. RAVENEL.
J. J. FERGUSON.	J. N. HURTY.	E. C. SCHROEDER.
J. W. FLABELLE.	J. R. MOHLER.	T. W. TOMLINSON.
W. D. HOARD.	V. A. MOORE.	F. TORRANCE.

J. G. RUTHERFORD, Chairman. M. H. REYNOLDS, Sec'y.

APPENDICES TO FOREGOING REPORT.

REPORT OF THE SUB-COMMITTEE ON EDUCATION.

The Sub-Committee on Education respectfully submit the following:

Bovine tuberculosis has become widely distributed throughout the United States and Canada, and it has been determined that efficient systems or methods for its eradication and prevention either under the supervision of the state or nation or by the cattle owners themselves are of necessity based on a knowledge of the nature of the disease and its means of dissemination.

Experience has shown that the principles of eradication and prevention may be successfully applied by individual owners of infected cattle, independent of state assistance.

Such individual aid is essential in conjunction with state or national assistance in the prompt eradication of the disease from infected herds and the prevention of its entry to non-infected herds. Therefore it is the sense of this committee that every possible means should be employed for educating the cattle owners and the general public concerning the nature of tuberculosis; the care and precautions necessary to prevent its entrance into herds already free from the disease; and in methods for its eradication from herds where it now exists.

Further, this committee approves of the following methods for instructing laymen, practising veterinarians, practitioners of human medicine and health officers in the nature and control of bovine tuberculosis, namely:

1. By the publication in agricultural and dairy papers of short, accurate and carefully prepared articles on bovine tuberculosis.
2. By the publication of appropriate articles on bovine tuberculosis in veterinary, medical and sanitary papers and journals.
3. By recommending to agricultural societies, granges and directors of farmers' institutes and unions and especially those interested in creameries and cheese factories that lectures on bovine tuberculosis, its nature and control, be made a part of their programs, and that so far as practical, demonstrations be held.
4. That those having in charge the arrangement of town, county and state fairs be requested to provide lectures on bovine tuberculosis, and if practicable to hold public demonstrations, at their annual meetings.
5. By placing a copy of the report of the commission in the hands of the deans or directors of all veterinary and medical colleges and schools of sanitary science in the United States and Canada with recommendations that special emphasis be placed in their courses of instruction on the nature of bovine tuberculosis and methods for its control.
6. That a pamphlet dealing with the nature of bovine tuberculosis and methods for its control should be written in language intelligible to the layman. This pamphlet should have the approval of this commission and the endorsement of the American Veterinary Medical Association. It should be published for free distribution.
7. That Departments of Agriculture, state veterinarians, live stock sanitary boards and others interested in the official control

of bovine tuberculosis be requested to promote as much as possible the educational features of their work, with the object of obtaining more support and co-operation from cattle owners.

The methods suggested for carrying out an educational propaganda are not to be considered at the exclusion of any and all other ways by which the public may become informed on the nature of bovine tuberculosis, its great economic importance and the necessity for an intelligent and united effort on the part of cattle owners and those having charge of the control of animal diseases to eradicate this great scourge.

The committee is of the opinion, from the history of the legislation regarding bovine tuberculosis in those states and countries which have attempted to deal radically with the problem, as well as from the special information which has been furnished by this committee to its members, and the light thrown upon the subject in the discussions at its several meetings, that in order to avoid friction and failure, all important legislation with reference to tuberculosis must be prepared with due consideration for the condition of public sentiment and information on this subject.

That tuberculosis control work should be developed in a progressive way.

That tuberculin tests made at a distance for public recognition (for example, in other states or foreign countries) can only be done satisfactorily by official veterinarians.

That the Delepine or Manchester plan of tuberculosis free areas gradually extended seems worthy of cautious trial.

(Signed) M. H. REYNOLDS, Chairman.
W. D. HOARD.
J. G. RUTHERFORD.

GOV. HOARD'S REPORT.

Educational Means for the Suppression and Control of Bovine Tuberculosis.

Mr. President and Gentlemen of the Commission—I place a high value on the work this Commission may do if performed wisely, in shaping the conviction and purpose of the people of Canada and the United States concerning the prevention and control of Bovine Tuberculosis.

As yet, that conviction is but little more than an ill-defined dread of something not clearly understood by the great mass of

farmers. Adding to this dread is a hope stronger yet, that the evil is not as great as has been asserted; that it is a scare that will soon pass over. And yet, in the minds of farmers and breeders generally, especially in those localities where demonstration work has not been had, there is a strong under current of conviction that all this talk about the disease is an interested plea of the veterinarians, that the trouble does not amount to much if the doctors and editors would hold their tongues and pens.

Just as long as this bank of fog exists, it will control all legislation and individual effort, to get rid of the difficulty. At the bottom of the matter is a widespread ignorance on the part of farmers as to the danger that threatens them; it is difficult to arouse them out of their conservatism, for as yet all they know about it is talk.

The conservatism of intelligence is vastly different from that which exists because of a lack of knowledge. The first demands more light; the latter dreads light.

From what I have seen in Wisconsin, I am convinced that the most powerful aid to that action against the disease which this Commission is so anxious to bring about is public demonstration. One animal slaughtered before a body of farmers, and the diseased parts exposed to their plain view, is worth more to foster conviction and inspire effort than anything else that can be done. If the federal and state governments would devote means for this demonstration work, it would prove a most powerful educator. Public agitation, in farmers' gatherings, and the talk of the agricultural press is useful mainly in keeping alive an interest in the subject. But, gentlemen, we must remember that with the majority of men, a large majority, "seeing is believing."

I believe, therefore, that this Commission should use its influence in urging legislation by municipalities and state and national legislatures for the spread and support of this demonstration work. Great care must be exercised, however, to select only such animals as will amply show forth the ravages of the disease. The great progress we have made in legislation in Wisconsin, and in securing a widespread acquiescence in the use of the tuberculin test, would never have come, had it not been for a large number of public demonstrations held in various parts of the state. We have gone as far as this in legislation: That after December 1, 1910, all animals sold for breeding or milking pur-

poses, must first be tuberculin tested. This, I believe, is a step further in advance than has been taken by any other state. It shows well the tone and temper of our farmers and the work which has been done to acquaint them with a true understanding of the situation. It is needless for me to say that if they are for the law, or any law, it goes; if they are against it, it is at best a dead letter. It is worth a great deal in the promotion of such objects to have a Live Stock Sanitary Board in a state that will take hold and lead in this work. In too many instances these organizations are purely negative in their influence, and so nothing is done. There is a notable lack of funds to bear the expense of demonstration work. The farmers everywhere would willingly be taxed for its support. Municipalities could well afford to have such expense for the sake of the education it would afford to consumers of meat and dairy products.

In conclusion, I would urge upon this Commission that special emphasis be placed upon the promotion of public exhibitions of diseased cattle before and after slaughter, as the most powerful means of education concerning the nature and danger of Bovine Tuberculosis.

(Signed) W. D. HOARD.

REPORT OF COMMITTEE ON LOCATION OF TUBERCULOSIS IN CATTLE.

Your Committee on the Location of Tuberculosis in Cattle desires to submit the following as its report upon this subject:

Though we are all agreed that no method for detecting tuberculosis in cattle equals the tuberculin test, we are forced to recognize that the universal application of the test under existing conditions is practically and economically impossible. The number of cattle to be tested, for example, is so great that, if all the available veterinarians and all such other persons as may be trusted to make tuberculin tests should be started on this work at once, and kept at it, years would pass before all the cattle in the United States and Canada could be tested even a single time. Consequently, our efforts to locate tuberculosis among cattle should depend primarily upon other means than the tuberculin test.

The tuberculin test should be regarded as having only an incidental value in the systematic work of locating tuberculosis, and as being of pre-eminent importance when we undertake the determination of the extent to which the disease is prevalent at

any point in any herd where it has been located by other means or, incidentally, by the tuberculin test.

In the order of seeming importance the means of location may be placed as follows:

1—Notification.

A law should be enacted requiring any and every person having knowledge of the existence of a case of tuberculosis among cattle to report the same without delay to some proper, designated authority. Such a law would be practically equivalent to the obligatory reporting of all clinical cases of tuberculosis which must be recognized as the most serious disseminators of tubercle bacilli and propagators of tuberculosis.

Since all cases of tuberculosis that are centers from which infection is being scattered, gradually become clinically recognizable, obligatory notification of all recognized cases of tuberculosis would alone in the course of a few years locate the majority if not all badly diseased herds. It would certainly locate tuberculous cattle and herds faster than they can be handled for some years to come.

2—Evidence Through Meat Inspection.

An effort should be made to trace tuberculous animals back from slaughter houses to the farms from which they were derived. This is important because if the well-conditioned animals which go to slaughter for meat are tuberculous, it is probable that among the animals retained on the farm some active disseminators of tubercle bacilli exist, which are retained at the farm either through ignorance or a false idea of economy.

Meat inspection has already done much to establish infected areas from which tuberculous animals have been sent to market. At present, however, it is difficult to trace animals to the farms from which they were shipped, and some method of identification by means of which any animal found on the killing floor to be tuberculous can be traced to its place of origin is greatly to be desired. A federal law requiring appropriate tagging, branding or otherwise identifying all hogs and dairy cattle moving interstate for slaughter and state laws compelling similar identity marks for these animals moving within the state for slaughter would be the means of locating a large proportion of the centers of tuberculosis. Experimental work of this char-

acter which has been carried out in the past has given very interesting results. For instance, when the occurrence of tuberculosis among hogs at an abattoir is followed up by a tuberculin test of the cattle on the home farm, it practically always discloses tuberculosis among these animals. Like much other evidence this encourages us to believe that tuberculosis among hogs will cease to exist as an economically important problem as soon as we succeed in controlling the bovine source of tubercle bacilli.

3—*The Tuberculin Test.*

When the tuberculin test is applied to cattle for any purpose it should be clearly understood that the reacting animals are to be regarded in every sense of the word as recognized cases of tuberculosis, which under an obligatory notification law, must be reported at once to the proper authority. In this way tuberculin will serve as an important means of locating tuberculosis among cattle that are tested for reasons like the following:

- (1) To obtain healthy animals for export.
- (2) To make sure that animals imported are free from tuberculosis.
- (3) To make sure that animals intended for interstate movement are free from tuberculosis. And here we would like to suggest that the states should protect themselves as much as possible against bovine tuberculosis by insisting that no new cattle shall be brought in until they have been shown by the tuberculin test to be free from tuberculosis. The time we may hope is not far off when even breeders of exceptionally fine strains of blood will begin to realize that the very best blood coupled with tuberculous infection is an article to be shunned, not because we wish to imply that tuberculosis is hereditary, but because we know how readily it is conveyed from animal to animal by contact.
- (4) To obtain from animals shown in the most conclusive manner to be free from tuberculosis, irrespective of whether the milk is intended for special certification or for more general or regular city use.
5. To satisfy an owner of cattle that his herd is free from tuberculosis or to give him the information he needs to clean his herd from disease.

In whatever way the tuberculin test is applied, or for whatever purpose, all positive reactions obtained should be regarded as placing the reacting animal in the category of recognized cases

of tuberculosis, which must be reported under a notification law. As the newer methods of applying tuberculin for test purposes have not been found to be as reliable as the older, subcutaneous method, they cannot be advocated. The ophthalmic and cutaneous tuberculin tests may have a value in some special cases, as for example, where doubt exists about the reliability of a subcutaneous test because an animal may have been subjected to some pernicious manipulation. In this sense these later modes of applying tuberculin should be kept in mind.

4—Examination of Material from Cattle and Herds.

The valuable evidence that may be obtained as to the location of tuberculosis through the examination of milk, cream, butter, centrifuge slime and other products and materials from cattle should not be neglected, especially when these examinations are made by health officers and others for the protection of public health, and are followed up by the inspection of the animals and the character of their environment as a routine procedure. Such inspections are constantly becoming more prevalent in various sections of the United States and Canada.

5—Most Important Sources of Animal Tuberculosis.

Tuberculosis as it exists among the domestic animals of America to-day undoubtedly owes its primary introduction to the cattle of improved breeding that have been imported from European lands from time to time in the past, for the purpose of improving the native stock of the country. No particular breed is to be incriminated in this charge, as several of the most prominent and popular breeds have been found guilty of furnishing tuberculous individuals to the best American herds on repeated occasions. The knowledge that infection has taken place from these sources in the past affords us a valuable indicator of the points where search should be made in our efforts to detect the cases of tuberculosis that exist to-day upon the farms of the country. First of all, then, attention may be directed toward all herds of pure bred cattle whether of beef or dairy type, especially to those from which cattle are sold, either by private or public sale, and from which cattle are thus distributed to various parts of the country; also to herds from which members are exhibited at fairs and exhibitions; and herds which keep males for custom service.

In addition to these herds of pure bred cattle, there are many others to which well-bred stock has been added for the purpose of grading up and improving the quality of the individuals of the herd. These in some instances have received the infection of tuberculosis with the new animals from which such great benefits had been expected, and these herds of well graded cattle should also be regarded with suspicion until they have been proved to be free of tuberculosis. Next in order should come all dairy cattle, but the methods by which the disease may be located in these herds has been discussed above.

(Signed) JOHN R. MOHLER, Chairman.
J. W. FLAVELLE.
C. A. HODGETTS.

REPORT OF COMMITTEE ON DISSEMINATION OF BOVINE TUBERCULOSIS.

The Sub-Committee on the Dissemination of Bovine Tuberculosis respectfully submits the appended report on the means for the dissemination of this disease, based on the present knowledge of the life history of the tubercle bacillus. The possible means for the dissemination of this disease are enumerated as follows:

1. The introduction into a sound herd of an animal or animals affected with tuberculosis: (*a*) those with open tuberculosis; (*b*) those in which the disease is in a period of incubation, and (*c*) those in which the lesions are temporarily arrested. The last group will not transmit the infection speedily, and possibly may never do so. The first group is certain to spread the virus.
2. By feeding calves milk, whole or separated, buttermilk or whey, where the milk has come from tuberculous cows.
3. By bringing cattle suffering from open tuberculosis in contact with healthy ones at fairs, cattle shows and other exhibitions.
4. By shipping healthy cattle in cars not thoroughly disinfected, recently occupied by tuberculous cattle.
5. By placing healthy cattle in stables that have not been thoroughly disinfected and which were recently occupied by tuberculous animals, as frequently happens with the change of farm ownership or tenants.
6. Tuberculous animals which do not react to tuberculin, such as those in the period of incubation or latent cases, but

which develop active tuberculosis later, are frequently carriers of the virus, although bought and sold as sound animals. These cannot at present be differentiated from sound animals. Therefore, all cattle coming from herds in which the disease exists should be considered as suspicious. The sound herd is the unit to deal with.

7. Tubercl bacilli may be transmitted by tuberculous cattle running in a pasture to healthy cattle in adjoining pastures where they are separated by a fence of such nature that the cattle may get their noses together.

8. Tuberculosis in cattle rarely, if ever, occurs through infection from (a) man, either directly or as a carrier of bovine tubercle bacilli; (b) from other species of animals, or (c) by infection from the droppings of crows, buzzards or other birds or carnivorous animals that have fed upon the carcasses of tuberculous cattle. It is the opinion of this committee that bovine tuberculosis is spread largely through the introduction of tuberculous cattle into sound herds; by the feeding of calves with infected milk, or milk products; by exposing sound animals to infected ones at fairs, or other cattle shows; and by exposing them to infected cars and stables. There are other ways in which now and then it is possible that an animal may become infected, but the means of dissemination mentioned in this paragraph are those to be guarded against in formulating efficient methods of control.

V. A. MOORE, Chairman.
E. C. SCHROEDER.
M. P. RAVENEL.

REPORT OF COMMITTEE ON DISPOSITION OF TUBERCULOUS ANIMALS.

Your Committee on the Disposition of Tuberculous Animals begs to submit the following report:

In the work of control and eradication of tuberculosis in animals it is first of all of the utmost importance to establish the presence of the disease in all the affected cattle, since only by such a procedure will it be possible to guard the healthy and newly-born animals from infection.

Fortunately we are in a position to determine with considerable certainty the vast majority of occult cases of tuberculosis in cattle, even the incipient cases, with the aid of tuberculin, and the clinical cases by physical examination. This alone consti-

tutes a great advantage in the work of suppression of the disease. The tuberculin test should therefore be considered as a very important step in the eradication of tuberculosis. As a matter of fact all the recognized authorities on the subject are agreed on this point. Once the tuberculous animals are recognized, consideration must be given to the most suitable and economical way of eradicating the disease from the herd. This naturally brings up the question of the disposition of the tuberculous animals, and in adopting any particular method, one should be guided by the extent of the infection in the herd, the quality of the affected animals, the sanitary condition of the premises, and last, but not least, the owner's intelligence and knowledge of the subject. The latter information is necessary to determine if reliance can be placed on the owner to carry out minutely all the details which are essential in executing any particular method of eradication that may be decided upon. The owner's co-operation in this work is without doubt a very essential feature of this great task. For this reason a campaign of education of the farmers and stock raisers relative to the control of tuberculosis in which all the advantages of the eradication of tuberculosis must be impressed on them, would greatly facilitate this important campaign. It is a well-known fact that any voluntary method of suppression by the herd owners themselves would bring about better and quicker results than when compulsory measures are enforced upon them by legislative enactments. Nevertheless the time has arrived when a campaign looking towards the control of this disease should be entered upon by the general government as well as the state and province. This campaign must reach in the first place all the clinical pulmonary forms of tuberculosis; then tuberculosis of the udder, intestines and uterus.

Having removed these exceedingly dangerous cases, the balance of the tuberculous herd may be treated by the Bang system, which consists of the establishment of two herds of cattle, one containing the animals which react to tuberculin, and the other those that proved to be healthy. Each class of cattle is kept entirely separate from the other, in different stables when possible, and under the care of separate attendants, using separate utensils. The calves born of the diseased cows are removed from their mothers at birth and placed in the stable with the healthy animals where they are reared upon the milk of healthy cows or upon other milk which has been properly pasteurized. In this way the healthy portion of the herd constantly increases, while

the diseased animals are disposed of as rapidly as may be deemed necessary until finally all of them are gone and the remaining herd is composed entirely of healthy cattle. The tuberculin test is applied to the healthy herd at regular intervals, annually or semi-annually, in order to detect any cases of latent tuberculosis or recent infection which may appear.

A modification of the Bang system is Ostertag's method of suppressing tuberculosis. This system demands only a clinical examination of the original herd with the elimination of all open cases of tuberculosis. The calves from the remaining cows are immediately removed and brought up on pasteurized milk in the same manner as in the Bang system, and a new herd is thus established from the young stock. Healthy nurse cows could be used for these calves instead of feeding them on pasteurized milk. The tuberculin test is applied to this new herd at stated intervals in order that any cases of tuberculosis which may develop therein may be discovered promptly. Neither of these systems, however, has met with much favor in this country, as it required a considerable length of time and care to create a herd free from tuberculosis by either of them. Nevertheless the inauguration of Bang's or Ostertag's method in herds of valuable animals whether they be dairy or beef breeds is unquestionably of an economic value and in such cases either of these systems should be encouraged. On the other hand, in ordinary beef or dairy herds, the practice of Bang's or Ostertag's method in this country has not met with much encouragement, owing to the extraordinary supervision, time and labor as well as the loss of market milk from the reacting cows which it involves.

In such herds the best ultimate results have thus far been obtained by the obligatory disposal of all the clinically affected cows and giving the dairyman the alternative either to pasteurize the milk from the remainder of his herd, or to be forced to refrain from selling the raw milk from the infected herd at all. In case he adopts the former method the herd composed of diseased and healthy cattle should be placed in quarantine under the supervision of sanitary authorities, and no sales should be permitted from the herd excepting for immediate slaughter. The alternative method will compel him to dispose of his tuberculous animals in the case he refuses to pasteurize the milk. The suppression of tuberculosis could be greatly facilitated and the co-operation of many of the herd owners could be gained by a provision by which a certain percentage of indemnity could at least

for a term of years be paid for the condemned animals. The scale for such an indemnity should be arranged in accordance with the final disposition of the carcass under competent inspection.

Another method of eradication should receive serious consideration as being of value in some localities. This is known as the Manchester system, which is either the Ostertag or Bang system applied to localized areas or even individual farms, from which centers the work progresses to surrounding or neighboring districts and farms. Inasmuch as the animals affected with clinical tuberculosis are the greatest sources of danger in the dissemination of the disease, compulsory reporting of such cases should be inaugurated by the state, as is now done in many places in the control of human tuberculosis. Mandatory reporting of these cases and their prompt slaughter are very essential, as only by the elimination of these exceptionally dangerous cases can it be hoped to take up all the other details by which a successful control of bovine tuberculosis may be accomplished.

In conclusion your committee, having regard to the disposition of pure bred cattle, or valuable animals kept for either breeding or dairy purposes, would strongly recommend a system requiring the removal of all clinical tuberculous animals from the herd, the segregation of all calves from the remaining cows in order to establish a new, clean herd, the use of tuberculin tested nurse cows or pasteurized milk for these calves, and the periodic application of tuberculin to this newly established herd, as the only thoroughly reliable one.

(Signed) W. C. EDWARDS, Chairman.
 JOHN R. MOHLER.
 FREDERICK TORRANCE.

APPENDIX "E."

THE COMMISSION'S RECOMMENDATIONS ON ERADICATION—A COMPOSITE OF THE METHODS OF BANG AND OTHERS.

The Commission after stating the known facts regarding the nature of tuberculosis and enumerating the principles to be observed in its prevention and eradication, recommends the following plan of procedure. It is recognized that in several points there are opportunities, in order to meet individual needs, to change or modify the directions herein given. It is understood.

however, that whenever such modifications are made they should conform in the greatest detail to the principles laid down in the report of this Commission. The plan has for its purpose the conservation of the herd whenever that is possible.

The control of bovine tuberculosis involves a definite procedure under two distinct and different conditions, namely: (1) Where a herd of cattle is free from tuberculosis and it is to be kept so, and (2) where one or more animals in the herd are infected and the purpose is to eradicate the disease and establish a sound herd.

Procedure Under Condition (1)—The prevention of tubercular infection in cattle, free from tuberculosis, consists simply in keeping tuberculous cattle or other animals away from the sound ones; in keeping tuberculous animals out of pastures, sheds or stables where the sound ones may be kept. Healthy cattle should not be exposed to possible infection at public sales or exhibitions. Raw milk or milk by-products from tuberculous cows should not be fed to calves, pigs or other animals. Cars that have not been thoroughly disinfected should not be used for the transportation of sound cattle. Cattle that are purchased to go into sound herds should be bought from healthy or sound herds only.

Procedure Under Condition (2)—The eradication of tuberculosis from infected herds requires, for conservation of the herd, different procedures according to the extent of the infection. For a guide to the control of the disease tuberculous herds may be divided into three groups, namely:

1. Where fifty per cent. or more of the animals are infected.
2. Where a small percentage (fifteen per cent. or less) of the animals are affected.
3. Where a larger number (fifteen per cent. to fifty per cent.) of the animals are diseased.

In eliminating tuberculosis from infected herds the following procedure is recommended:

Group. I.

Herds where a tuberculin test shows fifty per cent. or more of the animals to be infected should be treated as entirely tuberculous. The procedure here is as follows:

1. Eliminate by slaughter all animals giving evidence of the disease on physical examination.

2. Build up an entirely new herd from the offspring. The calves should be separated from their dams immediately after birth and raised on pasteurized milk or on that of healthy nurse cows. This new herd must be kept separate from any reacting animals.

3. The young animals should be tested with tuberculin at about six months old, and when reactors are found at the first or any subsequent test, the others should be retested not more than six months later. When there are no more reactors at the six months' test annual tests should thereafter be made. All reacting animals should at once be separated from the new herd and the stables which they have occupied thoroughly disinfected.

4. When the newly developed sound herd has become of sufficient size the tuberculous herd can be eliminated by slaughter under inspection for beef.

Group II.

1. The reacting animals should be separated from the non-reacting ones and kept constantly apart from them at pasture, in yard and in stable.

(a) *Pastures*—The reactors should be kept in a separate pasture. This pasture should be some distance from the other or so fenced that it will be impossible for the infected and non-infected animals to get their heads together.

(b) *Water*—When possible to provide otherwise reacting cattle should not be watered at running streams which afterwards flow directly through fields occupied by sound cattle. The water from a drinking trough used by infected animals should not be allowed to flow into stables, fields or yards occupied by sound animals.

(c) *Stable*—Reacting cattle should be kept in barns or stables entirely separate from the ones occupied by the sound animals.

2. Calves of the reacting cows should be removed from their dams immediately after birth. Milk fed these calves must be from healthy cows, otherwise, it must be properly pasteurized. These calves should not come in contact in any way with the reacting animals.

3. The non-reacting animals should be tested with tuberculin in six months, and when reactors are found at the first six months, or any subsequent test, the others should be re-tested not more than six months later. When there are no more reactors

at the six months' test, annual tests should thereafter be made. All reacting animals should at once be separated from the new herd and the stables which they have occupied thoroughly disinfected.

4. The milk of the reacting animals may be pasteurized and used.
5. Any reacting animal which develops clinical symptoms of tuberculosis should be promptly slaughtered.
6. An animal that has once reacted to tuberculin should under no circumstances be placed in the sound herd.
7. As soon as the sound herd had become well established, infected animals should be slaughtered, under proper inspection.

Group III.

Herds that come within this group should be dealt with either as in Group II., where the herd is separated, or as in Group I., where all of the animals are considered as suspicious and an entirely new herd developed from the offspring.

General Precautions.

In ALL cases animals that show clinical evidence of the disease should be promptly eliminated. They should be destroyed if the disease is evidently far advanced, if not, they may be slaughtered for food under proper inspection.

All milk from tuberculous cows that is used for food purposes should be thoroughly pasteurized. This means that it must be heated sufficiently to kill or to render harmless, any tubercle bacilli that may be present in it. For this, it is necessary to heat the milk for twenty minutes at 149 degrees Fahrenheit, or for five minutes at 176 degrees Fahrenheit. It is important that pails or other utensils used in carrying the unpasteurized milk should not be used, unless previously sterilized, for storing the milk after it is pasteurized.

When diseased animals are found, the stables from which they are taken should be thoroughly cleansed and disinfected. To accomplish this, all litter should be removed; floors, walls and ceilings carefully swept and the floors, together with the mangers and gutters, thoroughly scrubbed with soap and water. Thorough cleaning before the application of the disinfectant, cannot be too strongly emphasized. After cleansing, the disinfectant should be applied. A five per cent. (5%) solution of carbolic acid, a

1-1,000 solution of corrosive sublimate or a four per cent. (4%) solution of sulphuric acid may be used.

When stables can be tightly closed, formaldehyde gas properly used is reliable and satisfactory.

If tuberculous cattle have been kept in a small yard the litter should be removed, the surface plowed and the fencing and other fixtures thoroughly cleansed and disinfected.

REPORT OF THE RESOLUTIONS COMMITTEE.

Resolved, That the American Veterinary Medical Association extend a vote of thanks to Senators Warren and Gallinger for the valuable assistance rendered by them to our Legislative Committee in behalf of a bill to promote a more proficient veterinary service in the United States army; and be it further

Resolved, That our Legislative Committee be instructed to use every honorable means to secure the passage of such legislation as is now pending.

Resolved, That this association set aside a sum not to exceed \$500, to be used by the Committee on Legislation for the purpose of improving the standing of the army veterinary service.

Whereas, The A. V. M. A., after due consideration of Senate Bill No. 6049, known as the Owens Bill, establishing a Department of Public Health, find that said bill will, if enacted into law, transfer the Bureau of Animal Industry to the said new department; and

Whereas, We are convinced that the object to be obtained would best be obtained by the retention of the Bureau of Animal Industry in the Department of Agriculture, as at present; therefore, be it.

Resolved, That we protest against such proposed transfer, and our Legislative Committee is hereby instructed to use every effort to defeat this or any other bill looking to such transference; and, be it further

Resolved, That said Committee is hereby authorized to expend not to exceed One Thousand (\$1,000) Dollars of association money, under proper vouchers, for expenses of such work.

Whereas, Tuberculosis, a contagious disease, is prevalent to a greater or less extent among the cattle of certain sections of the United States, and is, without doubt, spreading to such an extent that it has already become a serious menace to the live stock industry; and

Whereas, Many individual owners, as well as many municipalities and sections, are engaged in its control, if not its extermination, and are seriously handicapped in this work by the almost unrestricted movement of cattle; therefore, be it

Resolved, That it is the opinion of this association that the interstate movement of dairy or breeding cattle should, at the earliest possible moment be prohibited by the United States Department of Agriculture, unless such animals have been proven free from tuberculosis, by being subjected to the tuberculin test made by an inspector of the Bureau of Animal Industry, or by some veterinarian duly authorized by the United States Bureau of Animal Industry.

Resolved, That this Association desires to convey to the various governmental and other bodies, and, especially, to the individuals who have so generously assisted in the work of the International Commission on Bovine Tuberculosis, an expression of its grateful appreciation of their services.

In view of the widespread interest of the veterinarians of the Pacific slope in this, the forty-seventh annual meeting, held in San Francisco; in view of the magnificent hospitality they have accorded to attending members and visitors, and, particularly, the thoughtful and splendid entertainment of our ladies; and in view of the general and personal goodfellowship, as well as the professional uplift promoted, be it

Resolved, That we voice our appreciation of the many, yes, limitless, provisions made for our comfort and pleasure, and assure the Committee on Local Arrangements that we will ever cherish the memory of our visit to the Pacific slope and the City of San Francisco because of their unselfish and untiring labors.

Whereas, we have learned with regret of the misfortune of our colleague and ex-president, Dr. M. E. Knowles, through the loss of his beautiful home and contents, which included a large veterinary library and all of the costly decorations and treasured keepsakes accumulated throughout the years; be it

Resolved, That we extend to our fellow member and his family our sympathy in this great personal loss.

G. H. ROBERTS, Chairman.
S. STEWART.
CHAS. G. LAMB.
A. S. COOLEY.
C. D. McGILVRAY.

ELECTION OF OFFICERS.

The election of officers resulted as follows:

President—George H. Glover, Fort Collins, Colorado.

Vice-Presidents—R. W. Ellis, New York, N. Y.; W. F. Egan, San Francisco, California; A. S. Cooley, Cleveland, Ohio; A. F. Kinsley, Kansas City, Missouri; C. D. McGilvray, Winnipeg, Manitoba.

Secretary—C. J. Marshall, Thirty-ninth street and Woodland avenue, Philadelphia, Pa.

Treasurer—G. R. White, Nashville, Tenn.

PAPERS AND DISCUSSIONS.

At a preliminary meeting (Monday, September 5, at 2 p. m.) of the Association of Veterinary Faculties and Examining Boards of North America, presided over by Dr. Geo. H. Glover, a paper was presented by Dr. W. H. Lytle, of Pendleton, Ore., on "What Constitutes a Fair Examination to All Applicants"; also a paper by Dr. S. Stewart, of the Kansas City Veterinary College, relating to the same subject, and Dr. W. Horace Hoskins, of Philadelphia, Pa., spoke on the subject, advocating an examination by the Federal government, which would at once admit a man to practice in *any* state and make him eligible for appointment as veterinarian in any branch of the government service. An interesting discussion followed.

The first paper presented at the regular meeting, Tuesday, September 6, was "Recent Veterinary Literature, Especially That Available to English-Speaking Veterinarians," by Dr. P. A. Fish, Ithaca, N. Y.

This was followed by "The Number of Semesters Which Should Constitute a College Course in Veterinary Medicine," by Dr. S. B. Nelson, Spokane, Wash.

Dr. Otto G. Noock, Reading, Pa., then presented his paper on "Veterinary Jurisprudence," which was followed by Dr. Geo. H. Glover, of Fort Collins, Col., on "Uniformity in Degrees and Matriculation Requirements for Veterinary Colleges." Each of the papers were discussed more or less at length.

The first paper presented on the morning of the second day, September 7, at the *Tuberculosis Session* (following the report of the Committee on Diseases), was "Open Air Experiments With Tuberculous Cattle," by Dr. J. G. Rutherford, Ottawa,

Canada, a very valuable contribution to the literature on this most important subject because it deals with clinical facts and not theories.

This was followed by another valuable paper dealing with the "Immunization of Cattle Against Tuberculosis," by Drs. J. R. Mohler and E. C. Schroeder, of Washington, D. C.

Dr. M. H. Reynolds, St. Paul, Minn., then presented a most excellent paper on "Legislation on Bovine Tuberculosis," which was discussed at some length by Drs. Rutherford, Nelson and McNair.

This session was closed by Dr. C. M. Haring's paper, Berkeley, Cal., on "Bovine Tuberculosis Investigations at the University of California Farm."

At 2 p.m., the *Medical Division* assembled, the opening paper being presented by Dr. F. F. Brown, Kansas City, Mo., on "The Application of Medical Agents to Disease." The doctor was followed by Dr. Herbert F. Palmer, Chicago, Ill., on "Nuclein."

Dr. D. B. Clark, Madison, Wis., then presented an interesting paper on "Johne's Disease," passing plaster casts showing folds in small intestines among the audience.

"Bursatee" was then presented by Dr. C. L. Roadhouse, Berkeley, Cal., and followed by "Experiments With the Intradermal Test for Tuberculosis in Cattle," by Drs. Archibald R. Ward, Berkeley, and Geo. S. Baker, San Francisco, Cal., Dr. Baker presenting the paper.

The last paper presented at this session was "A Nation's Loss, a Profession's Tribute to Fallen Leaders," by Dr. W. Horace Hoskins, Philadelphia, Pa., being a beautiful tribute to some members of the profession whose memories will always be dear to us and always prompt a feeling of reverence.

While the papers were being presented at this division in the main assembly hall, the *Pathological Division* was in session in another room at which Dr. John R. Mohler presented a paper on "The Diagnosis of Glanders by Konew's Precipitation Reaction," and Dr. B. F. Kaupp, Fort Collins, Col., on "Some Conditions Which Affect Phagocytosis."

Dr. S. B. Nelson, Spokane, Wash., opened the *Milk and Milk Hygiene Session* in the evening by presenting a paper on "The Practicability of Securing Wholesome Dairy Products," which provoked some discussion.

The paper of Dr. C. A. Dukes (M.D.), President of the Oakland Board of Health, entitled "The Necessity of Proper

Transportation in the Production of a Sanitary Milk Supply," was then read by one of the members, the author not being present.

On Thursday morning, September 8, Dr. L. A. Merillat, Chicago, Ill., opened the *Surgical Session* by an address on "The Present Status of Animal Surgery in America," which was one of the finest extemporeaneous addresses the members of the association have been treated to in some time, and one they will not soon forget.

Dr. Chas. G. Lamb then read Dr. Geo. R. White's paper on "The Surgical Restraint of Animals," Dr. White's voice having failed him through a cold in the throat.

This was followed by a paper on "Anaesthetics," by Dr. R. T. Whittlesey, Los Angeles, Cal.

Dr. O. A. Longley, Fresno, Cal., then presented a paper on "The Evolution of Antisepsis From a Surgical Standpoint."

"Veterinary Dentistry" was next presented by Dr. James Robertson, Chicago, Ill., followed by "Lameness of Horses," by Dr. Joseph Hughes, of Chicago.

"Modern Obstetrics in Animals," by Dr. J. H. Blattenberg, Lima, Ohio, followed.

"Surgical Variations in California," was presented by Dr. F. H. McNair, Berkeley, Cal., and the session was closed with the paper on "Canine Distempers," by Dr. A. V. Hall, San Francisco, Cal.; and it would be difficult to assemble into a program, or to conceive of a group of papers of more practical value to veterinarians than those presented at the San Francisco meeting.

THE CLINIC.

The Clinic, which was conducted by Dr. George White, Nashville, Tenn., was held in Dr. William F. Egan's branch hospital, 3250 Webster street, on Friday, September 9, when thirty-eight (38) operations were performed; a full account of which, will be reported in the next issue of the REVIEW with the *results*, which could not be given in this issue as sufficient time had not elapsed at this writing, and after all, it is the *results* that make the report of any value. The splendid location of the hospital, which is on a promontory overlooking the "Golden Gate," and the ideal weather, should be strong factors in the patients' favor.

THE BANQUET.

The banquet was held in the beautiful Gold Room of the Palace Hotel on the evening of September 8. The menu, a pretty feature of which being that it consisted entirely of native products, was excellent; California fruit, flowers and wine were in profusion, making the setting superb, and causing a sense of the whole-souled hospitality, characteristic of the people of the "Golden West," to pervade the very atmosphere.

At the close of the courses, President-elect Dr. Geo. H. Glover, in the capacity of toastmaster, called upon the following speakers in the order named to respond to the respective toasts: "California," Congressman, Julius Kahn; "The Ladies," Dr. W. E. D. Morrison, Los Angeles; "The Doctors," Mrs. A. T. Kinsley, Kansas City; "The Far North," Dr. E. A. A. Grange, Toronto, Canada; "The Far East," Dr. R. W. Ellis, New York; "The Far West," Dr. S. B. Nelson, Spokane; "The Bureau of Animal Industry," Dr. A. D. Melvin, Washington, D. C.; "Canada," Dr. J. G. Rutherford, Ottawa, Canada; "The Practice of Veterinary Medicine," Dr. L. A. Merillat, Chicago; "Veterinary Progress In California," Dr. R. A. Archibald, Oakland. Other toasts, responses to which were not made, through the absence of the parties to whom assigned, were, "The Veterinarian of the Future," assigned to Dr. J. C. Norton; "The Far South," assigned to Dr. W. H. Dalrymple, and "Veterinary Education," assigned to Dr. David S. White.

Out of the usual order of A. V. M. A. banquets were songs and recitations by professional talent interspersed between the addresses, which were much enjoyed. The most unique and at once the most pleasing *new* feature, however, was the response to the toast "The Doctors," from Mrs. Kinsley, whose thorough self-possession, perfect delivery and indulgence in little witticisms disclosed to her auditors the fact that it was not her maiden public address, even though a new feature at an A. V. M. A. banquet; and is an initiative toward making the ladies a *part* of the banquet rather than *visitors at it*. Finally as the midnight hour was approaching, Toastmaster Glover, who, by the way, robbed the world of a good comedian when he became a veterinarian, and who had contributed very largely to the evening's enjoyment in his pleasing announcements of the several speakers, declared the entertainment ended, and brought to a close one of the most enjoyable occasions ever participated in by an A. V. M. A. gathering.

THE TRIP WEST ON THE AMERICAN VETERINARY SPECIAL.

The AMERICAN VETERINARY SPECIAL cars, as per schedule, published in the August number of the REVIEW, left Chicago at 6.30 p. m., August 30th, with a merry party of A. V. M. A. conventionists, consisting of members of the association, their wives, friends and visiting veterinarians. Night closed around it as it proceeded through the state of Wisconsin and entered Minnesota, arriving at St. Paul at 7.20 a. m. of the 31st. A little change from the routine of train travel was indulged in at that place by the party leaving the train and going up into the heart of the city for breakfast, which was had in "The Chapel," a breakfast room in a large restaurant built to represent a chapel. The picturesque appearance of the place, and the excellence of the food, well repaid the party for the walk. The train proceeded out of St. Paul at 9.30 a. m. Some of the party motored over to Minneapolis as guests of Dr. Cotton (who met the "special" at St. Paul), crossed the Mississippi River and joined the party again at the latter place. The train continued to speed along the Mississippi, through the great state of Minnesota, with its



SHOWING PASSENGER COACH FROM WHICH PASSENGERS CRAWLED OUT ON OPPOSITE SIDE AND TWO OVER-TURNED BAGGAGE CARS CONTAINING THE PARTY'S TRUNKS; ALSO WRECKED TENDER AND LOCOMOTIVE IN THE DISTANCE.

miles upon miles of wheat fields until late in the afternoon, when the party found themselves at Fargo, North Dakota. All during the remainder of the day, the train sped through the latter state at fifty miles an hour, revealing its importance to those observing

it for the first time by its vastness and the fertility of its soil, as evidenced by the wheat fields which reached far out of sight in either direction and still continued to stretch beside the fleeting train when night closed in around it; the "Bad Lands" being passed through during the night. In the early morning of Sep-



SHOWING REAR END OF OVERTURNED PASSENGER COACH AND FRONT END OF FIRST CAR NOT UPSET; ALSO TRUCKS WRENCHED FROM BENEATH FORWARD CARS AND BENT TRACK-RAIL.

tember 1st the border line of Montana was crossed, and the train had traversed about sixty miles of its territory, when at 5.20, while running at about thirty-five miles an hour, following the many bends of the Yellowstone River, it stopped so suddenly as to give the impression that it had come in contact with a mountain, or something equally resistent. The sleeping travelers, thus suddenly awakened, got hurriedly out of their berths to learn the cause of this sudden arrest in their journey, and found themselves to have been suddenly transformed into heroes of a train-wreck in the wilderness of Montana. One of the two locomotives used to pull the train up the heavy grade, two baggage cars and a passenger coach were found to be derailed, wrecked and partly overturned. The occupants of the passenger coach crawled out of the windows which laid over close to the ground.

The trucks from the these cars had been wrenched from beneath them and laid crosswise of the tracks which had been forced off the ties laterally to the right.

A prayer of thanksgiving involuntarily escaped from the lips of everyone as they learned of the extent of the wreck, and at

the same time realized that not a single person was so much as scratched. This realization had the effect of putting the party in an hilarious frame of mind, and they immediately determined to enjoy to the full, what time was placed at their disposal through the delay necessary to effect the requisite repairs. About the time that all had inspected the wreck, some viewing it from a nearby hill from which they could look down upon it, as well as a nearby inspection, the wrecking train had arrived with men and material to repair the damage; the first step of which was to remove the uninjured part of the train (which included the three Pullmans and diner of the A. V. M. A. party), about five miles back from the scene of the wreck where they were left



SHOWING SECOND LOCOMOTIVE WITH DERAILED TENDER AND TOPS OF OVERTURNED CARS BEHIND BANK.

until the repair work was completed. As soon as the cars had been thus placed, the party left them and could be seen in little groups crossing the plains, picking their way among the cactus and sage bushes, which seemed to be about all there was to sustain the range horses, a band of which was soon encountered, and appeared to be in remarkably good condition, notwithstanding. Off in the distance could be seen a very high hill formed of a sort of soft shaling stone, which seemed to be the goal of the "tenderfeet," who were not content until they had reached its summit, from which they beheld a view of the surrounding country for twenty-five miles in every direction, uninterrupted by house or tree, which it will be difficult for them to forget, and commanded a view of the Yellowstone River for nearly that

length. In the incredibly short time of seven and a half hours, the bank into which the cars were forced, was dug away, new tracks laid off from the main line past the wrecked cars, and the train (leaving them behind) proceeded along the Yellowstone and soon got out of the waste land into a more fertile part of the state, towards Miles City, reaching an extensive sheep raising district, and Fort Kehoe, where the U. S. Government raises horses for army purposes. Friday, September 2d, found the special running along the Flathead River, reaching Paradise about eleven a. m., with snow-capped mountains in the distance and farming going on in the sun-kissed valley below. An elevation of more than five thousand feet above sea level had now been reached, and the descension on the western slope of the "Rockies" was begun, and the rivers were noticed to be running west toward the Pacific. Thompson Falls was reached at twelve noon, and as the sun descended the mountain ranges were left behind, and the train ran into the flatlands of Idaho (a small corner of which was traversed), pausing for a time at the town of Sand Point, that state, and finally reaching Spokane, Washington, about 4.30 p. m., where the party was welcomed by Dr. S. B. Nelson, and Mr. R. J. Maclean, Secretary of the Spokane Chamber of Commerce and escorted to the Chamber by those gentlemen, where each lady and gentleman of the party was invested with a badge of welcome, invited to register in the visitors' book, and allowed to roam about the building inspecting the splendid exhibits of fruit, vegetables and grain for a time, when they were taken in "special" electric cars over the city; the beauty and refinement of which, caused no little comment. At the conclusion of the car ride a luncheon was served in a handsomely appointed restaurant, and Mr. Maclean, acting as host in behalf of his city, called upon Drs. Hoskins, Rutherford, Lyman, Brenton and Winchester, for a few remarks. As the last speaker finished, but seventeen minutes remained in which to reach the train; where further evidence of the welcome and good-fellowship accorded by Dr. Nelson's city awaited the party, in the form of a large basket of fruit for each individual, and a box of flowers for each of the ladies. The following forenoon found the party alighting from the train at Seattle, where the President of the Chamber of Commerce of that city and a number of Seattle veterinarians awaited them with a large number of automobiles in which they were conveyed all over that remarkable city of a quarter of a century and-

taken to the Arctic Club, whose building is a marvel of massive beauty, for luncheon. Here again speaking followed the repast, in which Drs. Hoskins, Rutherford and several Washington State veterinarians participated. A walk about the city, visiting some of its stores, occupied the rest of the time until 4.10 p. m., when the train proceeded, reaching Portland, Oregon, at midnight; but many were sufficiently enthusiastic to remain up and take a run into the city, whose ample illumination afforded them an opportunity to get some idea of its character. At 1.30 a. m., those that were out re-entered the cars to begin the last section of the trip. On awakening on Sunday morning, September 4th, the party on looking from their windows found themselves traversing the fertile lands of Oregon, reaching Ashland late in the afternoon, where a few minutes' stop was taken advantage of, and the members of the party descended from the train and indulged themselves in a little walk, fresh cider and luscious plums. On leaving Ashland they suddenly found themselves *again* ascending; this time climbing the Siskiyou Mountains, heavily wooded, green and very steep. Hitherto the special had trailed its way through mountains by creeping between the elevations turning and twisting along the banks of rivers; but with the Siskiyou, it was a case of climbing in the full sense of the word; and it is doubtful that any member of that party will ever forget the winding back and forth and redoubling on itself that that train with two locomotives did, as it wound its way up the side of the mountain, going along declivitous ledges and crossing trestles over chasms, the bottoms of which were hundreds of feet below, until it had reached the top, at an elevation of 4,125 feet above sea level; then gradually descended on the other side, crossing the state line into California just as night closed in, enveloping the speeding train in darkness. The dawn of the last day on board the train (Monday, the 5th), which had been the home of the party for a week, found them regretting the thought of parting from each other, and seemingly not suffering in the least from fatigue, as their train passed through the beautiful farm lands of California, cutting down through the centre of the State, with cattle, horses and mules in great numbers grazing upon either side, until Bernicia was reached, where the train, with its two immense mountain-climbing locomotives, was run upon the deck of the "Solano," the largest ferryboat in the world; having an area of one acre, which carried the train across Carquinez Straits, a distance of one mile,

to Porta Costa; from which point, it again proceeded by rail to Oakland, where its party bade good-bye to the Pullmans and their faithful porters, which had been with them for seven days, traveling over three different railroads, *i. e.*, the Burlington, the Northern Pacific, and finally the Southern Pacific, crossing San Francisco Bay in a large ferryboat, they found themselves in the beautiful city of their goal, San Francisco.

SOCIAL FEATURES.

On the morning of the opening of the convention the ladies and visitors, as has been customary for a number of years, were in attendance at the opening exercises and immediately after luncheon started out to see San Francisco as guests of the veterinarians of California, whose entertainment committee had provided a program of entertainment that promised to keep them busy to carry out. This committee in turn delegated one of its members, Dr. P. H. Browning, of San Jose, to take complete charge of the ladies and friends. The committee explained that Dr. Browning was thus singled out for this special work because he is the best looking veterinarian on the Pacific coast, and it requires but a glance at that tall, well-set-up gentleman to convince one of the wisdom of the committee in their selection. But that is not the only thing about the doctor that commended him to the position, as he is possessed also of more than an ordinary degree of executive ability; an essential in order to be the success Dr. Browning proved to be *with the ladies*.

On this first afternoon they were taken in automobiles over the resident and business portions of the city, through Golden Gate Park, along Ocean Boulevard to the Cliff House (this being a new one that has replaced the old Cliff House of international fame), and Seal Rocks, to the Sutro Gardens, and finally through the Presidio; bringing them back to the hotel in time to have dinner and dress for the reception that was tendered them, the members of the association and visitors, in the ball-room of the Palace Hotel, where everyone became acquainted, and many were lured upon the floor by the charm of the music. Refreshments were provided in the ante-room and the evening proved to be an enjoyable one.

On the following day the ladies were escorted to Mt. Tamalpais and Big Tree National Park; luncheon being served on the mountain. In the evening they were taken through Chinatown.

The following day (Thursday) a wonderful treat was in store for them in the form of a trans-bay trip, taking in San Francisco Bay, Yerba Buena, United States Naval Training Station, Oakland, Berkeley, University of California, Greek Theatre, Piedmont Gardens, Piedmont Springs, Great Art Gallery, Ostrich Farm and many other attractions, lunching at Piedmont Springs. In the evening they attended the banquet in the Gold Room of the Palace Hotel.

Friday morning at ten o'clock Dr. Browning assembled his ladies in the hotel parlors preparatory to escorting them to stands that the committee had had erected, to witness the parade* of the "Native Sons and Daughters of the Golden West," which proved to be in an admirable location.

Too much praise cannot be given the ladies of California for their unceasing attentions to the visiting ladies during their stay in San Francisco, which they left with a sense of having been truly welcomed.

POST-CONVENTION PLEASURES.

On Friday, September 9, the day following the last day on which the meeting convened, although a very important one for those of its members engaged in general practice (Clinic Day), was the beginning of post-convention pleasure and entertainment for many veterinarians who had been in close attendance at the several sessions during the three previous days and who hoped on this occasion to witness, with their ladies, the parade of the "Native Sons and Daughters of the Golden West," in commemoration of the admission of California into the Union as a state (September 9 being "Admission Day"), and still attend the clinic. Most of those who witnessed the celebration, however, were disappointed in their hope to attend the clinic as the parade occupied most of the day, and the difficulty in street traffic incident upon the same made it impossible for them to reach the clinic after the parade had passed and was returning over considerable of the ground it had originally traversed. But they can console themselves in the fact that they have witnessed one of the most beautiful spectacles that it will be their privilege to behold in a long time again, if ever. Ladies and gentlemen of society in their loyalty to the state of their birth, walking hour after hour through the streets of San Francisco, on one of the

* See under head of Post Convention Pleasures on page 138.

rare occasions in that city, *a hot day*, but, as we were informed, a characteristic "ninth of September." The beautiful color effects produced by the contrasts in the costumes of the ladies of the different "Parlors" (as the various lodges of the order are designated), was most striking. The custom being to have dress, hat and parasol alike, and then a floral decoration on each. As a striking example, picture fifty ladies in jet-black dresses, black hats and black parasols, with each of these parts of their fifty costumes tastefully decorated with California poppies; another fifty in pure white, with some richly colored floral decoration in contrast; and, if you can conceive of the beauty of the coloring in California flowers, you will get *some* idea at least, of the ladies' part in the celebration of "Admission Day."

The men were equally tasteful in their dress. Besides which, an Indian village, and many other "floats," in addition to the military organizations, etc. Many beautiful horses filled the streets, forming a conspicuous feature of the parade; both under the saddle and attached to carriages drawing the pioneers of the state, and state and city officials. Prominent among the latter, from the standpoint of the A. V. M. A. members, was His Honor Mayor McCarthy, of San Francisco, who had welcomed them so heartily to his city on the opening day of the convention. The evening of that day is one long to be remembered. It was en-carnival, a time of merry-making, in which resident and visitor took part with equal zest, so that those who had absented themselves from the streets for an hour or two at theatre or other place of amusement, returned to find confetti filling the streets and covering the hats and shoulders of pedestrians in a manner to remind one of a recent snow-fall. Late that night and the following day found the members of the convention departing from the convention city for other points of interest. Some to visit relatives or friends in nearby places, others taking the steamer for Seattle, Vancouver and other northern points, while still others (and we believe the greatest number of the original party to hold together), took the coast route to Los Angeles, from which city many enjoyable and instructive side-trips were made to places of interest in southern California. The most extensive and perhaps the most interesting of which was the trip to Catalena Island, a wild mountainous island whose highest peak is about 2,200 feet elevation, lying twenty-seven miles out to sea. This trip was accomplished by electric railway to San Pedro, twenty-two miles from Los Angeles and by

steamer from that port to the island, landing at a cozy little settlement called Avalon, nestled in a cove on the east coast of the island. Aside from this settlement and another small one in the hills, twenty-two miles to the north, the island is uninhabited with the exception of a sheep ranch somewhere in its centre beyond the mountains visible from its east coast, on which 40,000 sheep are kept. These, and about 20,000 wild mountain goats practically comprise the animals living on the island, which is twenty-two miles long and has an average width of seven miles. Another interesting and instructive feature in connection with the trip to Catalena Island, are the submarine gardens and seal rocks. These are seen by going in glass-bottom steamboats along the east coast of the island, where, looking down through the glass bottom of the boat, beautiful fish of various colors (among others the largest and most beautiful gold fish in the world), may be seen sporting about in shady submarine parks, composed principally of a form of sea weed called "kelp," from which iodine is made. Then passing on into deeper water, and along a more rugged portion of the coast until the seal rocks were reached; where great numbers of seals could be seen reclining in their natural habitat, and the wild goats climbing among the rugged cliffs. Seals also played about the fishing pier at Avalon, where they had become quite tame. On the end of the pier a fish recently caught was hanging on the scales, which recorded the enormous weight of two hundred and thirty-one (231) pounds. Our surprised comment was answered by the information that one weighing three hundred and ten (310) pounds had been caught the day previous. They were a species of sea bass. We had become somewhat prepared for surprises on reaching the island, as when we were about fifteen miles out to sea on our trip down we had had the unusual privilege of seeing a large whale, who seemed to know the steamer contained passengers not used to the Pacific, as he took particular pains to show himself well, first blowing to attract attention to his location, then showing his tail, and finally the greater part of his back on more than one occasion as he traveled parallel with our steamer, the "Empress," for a considerable distance.

As the steamer was about to leave the pier for the return trip to San Pedro, boys and young men in row boats suddenly swarmed about it importuning the passengers to throw coins into the harbor; for which they dived with a dexterity that could only be acquired by long practice; as the coins would scarcely descend

two feet below the surface in many instances before the boys would have secured them; when they would quickly return to their boat, deposit them upon the seat and call for more; and many dollars in nickels and dimes were transferred from the "Empress" to the row boats before she steamed out of port. While the delights of this trip were being experienced by some, others were beholding with wonder the extent of the Los Angeles oil district as they passed on to Echo and Elysian Parks, through the gateway to San Fernando Valley and out into the beautiful Cahuenga Valley with its orange, lemon, fig, olive and walnut groves, and some of the most beautiful suburban homes, with their tropical grounds and palm trees; the bungalows covered with trailing bouconvillea, roses and scarlet geraniums found in southern California. Others were walking over the grounds of the National Soldiers' Home at Sawtelle, with its beautiful tropical park of seven hundred (700) acres, massive barracks and numerous government buildings, making a pleasant home for three thousand (3,000) war veterans; aptly termed "Old People's Paradise." And still others are at Santa Monica enjoying the pleasures of the two miles of boulevard and beach of this city by the sea, in a camera obscura. No one left southern California without visiting Port Los Angeles with its pier, which is said to be the largest pleasure and fishing wharf in the world, and lunching at Playa Del Rey, a few miles below in the auditorium dining room overlooking the sea, nor without seeing the wonderful pool at Redondo Beach, whose capacity is one hundred and forty-eight thousand (148,000) gallons of water, and has all the modern appointments.

While some were enjoying the plunge here, others were gathering moon stones on Moon Stone Beach, a few miles away; and many pretty trophies were picked up on the very edge of the sea; oftentimes at the expense of a wetting, as the tide stealthily overtook the treasure searchers. Long Beach, twenty-two (22) miles from Los Angeles, seems to be the favorite spot for surf bathing, and many of our conventionists bring home with them a pleasant memory of the caressing waves under an ideal sky to be followed by the joys of an indoor plunge before dressing.

And so we might go on enumerating, Ocean Park, Naples and many others, as southern California seems to pride itself on its beaches, and has spent millions of dollars to improve them without any prospect or expectation of direct money returns; but to pass without referring to the Venice of America, would

be inexcusable. This is one of the most completely equipped amusement and pleasure resorts on the Pacific Coast; with its immense concrete canals with gondolas and true Venetian arched driveways; Venetian Villa City, colonnades and arcades. It also has a miniature railway, composed of a real locomotive in miniature, and a long train of open cars that take you around the city, going over the canals on arched stone bridges.

Venice also has a twenty-thousand-dollar (\$20,000) aquarium, an Oriental exhibit, a scenic railway, bath houses and all the amusement making et ceteras of an up-to-date coast resort. And few left Los Angeles without having visited Pasadena, seeing the miles of orange groves lying around that most beautiful little city and visiting Cawston's Ostrich Farm, the largest in California, one hundred and fifty (150) birds are kept near the plant, where the feathers are prepared for sale, and a thousand on the farm some distance away; or without having gone over to San Gabriel Mission, ten miles east of Los Angeles, founded by Spanish priests in 1771, in which services are still held. Its primitiveness is in marked contrast with the churches of to-day, when you consider that the present building was erected in 1790; and some of the pictures of the Apostles and other saints which adorn the walls, date from that time. We cannot attempt to tell of all the places visited by our members while in the southland; for while some were visiting surrounding cities others were exploring the wonders of the City of Los Angeles itself; plunging into the "Bimini Baths;" known also as the "Velvet" bath from the softness and natural warmth of the water which flows from a great depth in the earth. The owners having bored for oil without success until nearly ruined, when they struck this ideal water for bathing purposes, constructed the baths and have made millions of dollars from them. Also in the city proper, of the three world-renowned Chinatowns of New York, San Francisco and Los Angeles, the latter city has the largest. In it at night members of our convention visited Chinese homes, saw large Chinese stores, Chinese boarding houses, opium and gambling dens, and entered a Chinese Masonic chamber and were astounded at the beauty of its altar. The foregoing will give our readers an idea of *some* of the things seen after the close of the convention, the rest we will leave to their imagination, and for those of their friends who were of the party to relate to them.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION.

Lake City made good as a convention city for the semi-annual meeting of the above association, which held a two days' session there on Wednesday and Thursday, July 13 and 14, 1910. The weather was ideal and no effort was spared by the local citizens to make the stay of the veterinarians one of pleasure. Forty or more doctors and their wives were in attendance and enjoyed themselves thoroughly.

The opening session was called to order in the City building at 2 p. m., and the business transacted in the following order: Reading of the minutes, Report of the Board of Directors meeting at Dr. Cotton's office; accepted. Election of new members as follows: J. J. Hughes, Glencoe; J. H. Kirtzhofer, Glenwood; Wm. A. Getty, Fairmont; Wm. L. Dockstader, Lyle; F. P. Burke, Madelia; F. G. Mason, Hibbing; R. C. Williams, Stillwater, and W. F. Flanery, St. Charles.

Voted to refer the matter of resolution on the death of Dr. J. W. Gould, to the Board of Directors, with instructions to draft same.

Moved by Dr. W. L. Beebe and seconded by Dr. W. Amos, that a committee be appointed to draft a code of ethics and report same to society at the next meeting for endorsement. Carried. Committee—Beebe, Mack, Amos.

Paper by Dr. E. A. Sotaaen. Subject, "Extra Uterine Pregnancy in Mare." Discussed by Drs. Lees, Hay, Lyons, Lyford and Scott.

Paper by Dr. C. C. Lyford. Subject, "String-halt." Showed great study. Discussed by Drs. Lees, J. N. Gould, Cotton and Hay.

Paper by Dr. E. A. Sotaaen. Report of a case of "Torsion of the uterus."

At 6.30 o'clock in the evening the Lake City Commercial Club tendered the veterinarians and their wives an informal reception and collation at Woodman Hall. More than one hundred guests partook of a substantial luncheon, after which a program of toasts and music with E. R. Paterick as toastmaster formed the evening's entertainment. C. A. Hubbard, president of the Commercial Club, made a few introductory remarks, after which City Attorney Wesley Kinney, in the absence of Mayor Foley, gave the address of welcome. The response was given

by Dr. G. Ed. Leech, of Winona. The remainder of the program included toasts by Dr. G. S. Todd, Dr. C. C. Lyford, of Minneapolis, M. J. O. Laughlin, Dr. J. C. Adams and R. D. Underwood. Musical numbers were rendered by Mrs. James Scott, Miss Nona Jenkins, Chas. Myhre, and Miss Marguerite Williams. The program closed with a reading of a selection from "David Harum" by Mrs. A. W. Corwin. The visitors were entertained Thursday morning with an auto ride about the city and through the nursery grounds. In the afternoon they were treated to a launch ride on Lake Pipin, which was tendered them by the Yacht Club in the launches "Idalia III.," "Florence" and "Marian." They were much impressed with the scenic beauty of Lake City and vicinity and were profuse in their complimentary remarks.

One of the features of the meeting was the tubercular exhibit, which the bacteriological department of the Live Stock Sanitary Board had on display. The display consisted of sections of diseased meat under glass, showing the tubercular affected organs of cows, pigs and chickens.

At the open meeting held Thursday evening at the City Building, tuberculosis was the general subject discussed. Dr. J. P. Anderson presided. Dr. J. C. Adams gave a brief talk at the opening of the program, after which Dr. M. H. Reynolds read a paper on "Bovine Tuberculosis as a Public Welfare Problem." He emphasized the importance of interesting the public in the problem and declared that public sentiment must be aroused before it could be eradicated. He spoke of the magnitude of the task which confronted the veterinarians of this state in their work of inspecting dairy herds and applying the tuberculin test.

"A competent organization and a feasible policy must go together," declared the doctor, "if the disease is to be eradicated."

Miss Anna Stevenson played a piano solo, after which Dr. J. J. Fretz, B. A. I. at Winona, discussed the subject of "meat inspection." He condemned local slaughter houses, declaring them to be unclean, unsanitary, and hot-beds for disease. He urged the erection of a municipal abattoir, to which all butchers could have access and which could be kept clean and sanitary. A solo by Chas. Myhre was followed by an illustrated lecture by Dr. G. Ed. Leech. The views consisted of live stock, barns and cuts of meat, showing the contrast between clean, healthy and sanitary conditions and the reverse. The next speaker was Dr. W. L. Beebe, who made a brief talk on "Milk Transmissibility."

The last musical number was a violin solo by Miss Marguerite Williams with piano accompaniment by Miss Florence Hubbard, after which Dr. E. H. Bayley made a few remarks.

A poem was read by Mrs. G. Ed. Leech, "A Toast to Men." At the conclusion the association by a rising vote passed unanimously a resolution of thanks to the citizens of Lake City for the courteous treatment and delightful entertainment afforded the veterinarians during their sojourn in the city.

RESOLUTIONS ON DEATH OF J. M. GOULD.

Whereas, Our attention has been called to the fact that the Divine Ruler of the Universe has again reduced our ranks by death and has taken from among us our esteemed and honored member, Dr. J. W. Gould, and,

Whereas, Those of us who knew him best will miss him most as an adviser, counsellor and professional brother; be it

Resolved, That we express our sympathy for this loss and bereavement by tendering to the immediate family and relations of Dr. J. W. Gould, our feelings of sympathy and condolence in this, their hour of grief; and be it also

Resolved, That a copy of this resolution be sent to members of the immediate family and also be spread upon the records of this society.

DR. J. P. ANDERSON.
DR. C. S. SHORE.
DR. C. A. MACK.
DR. G. ED. LEECH.

The meeting was then declared adjourned.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held at the Preble House, Portland, on July 13, 1910, with President Joly in the chair, and the following members present: Drs. F. L. Russell, C. W. Watson, A. Joly, C. W. Purcell, C. H. McGillicuddy, H. L. Stevens, E. E. Russell, W. H. Lynch, W. L. Mebane, Geo. F. Wescott and C. L. Blakely.

Dr. H. H. Newcomb, of New York, was present as a visitor, representing C. Bischoff & Co., American agents for Von Behr-

ing's "Bovovaccine," which is being used quite extensively in Maine. Drs. M. E. Mattox and C. F. French were also present as visitors, both having successfully passed the State Board of Veterinary Registration Examiners.

The Executive Committee reported favorably on the application of Dr. B. L. Pratt, of Caribou, for membership.

Letters were read from Drs. Salley and Lord, regretting their inability to be present.

The association listened to a very able paper by Dr. W. H. Lynch, of Portland, entitled "Monoliths of Comparative Medicine," with special reference to serotherapy. Considerable discussion followed. Dr. C. W. Watson related his experience with a French hog cholera serum.

Dr. M. E. Mattox spoke of his work in the University of Pennsylvania laboratory in preparation of antitoxin.

A communication was read from Dr. R. P. Leyman, asking the association to elect a representative to the American Veterinary Medical Association meeting at San Francisco in September.

After considerable discussion, the meeting voted to meet with Dr. Joly in October at Waterville. Papers to be read by Drs. Salley, Robinson and H. L. Stevens.

Meeting adjourned at an early hour.

C. L. BLAKELY, Secretary.

YORK COUNTY VETERINARY MEDICAL SOCIETY.

The quarterly meeting of this society was held in the parlors of the National Hotel, York, Pa., on September 6, 1910. The papers of Drs. W. L. Herbert and E. S. Bansticker on "Colic In Horses" and "Pyemic Arthritis," respectively, were of unusual interest and provoked lengthy discussions. A number of dogs having recently died in the City of York, apparently from arsenical and strychnine poisoning, a discussion on poisoning by those alkaloids was of general interest. The members also gave considerable time to the discussion of rabies, tetanus in horses and the use of anti-tetanic serum in acute cases, and the testing of cattle for tuberculosis, before they finally adjourned to meet December 6, 1910.

E. S. BAUSTICKER, Secretary.

AMERICAN VETERINARY REVIEW.

NOVEMBER, 1910.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, September 15, 1910.

GALL SICKNESS OF SOUTH AFRICA—ANAPLASMOSIS OF CATTLE.—This second name is proposed by Dr. Arnold Theiler, the well-known government veterinary bacteriologist to the Transvaal. Name of a disease, whose pathology has finally been cleared up by him, which is recorded in the *Journal of Comparative Pathology and Therapeutics* of June, 1910, and which is due to "a protozoon, anaplasma marginale, which invades and destroys the red corpuscles, causing primarily an acute anemia, accompanied by a high fever and, secondly, a degeneration of the larger parenchymatous organs."

What is Anaplasma?

In previous communications made by the author, of experiments made with various blood parasites, piroplasma bigeminum, piroplasma mutans, spirochæte theileri and others, allusions were made to the presence of peculiar coccus-like bodies found on the periphery of red corpuscles, and which were described under the name of "marginal points." By observations and various experiments related in his last article, the author is brought to "no other conclusion than that these marginal points are the cause of a typical disease—a grave anemia which to a great extent resembles that caused by piroplasma bigeminum—that they stand in no relation to piroplasma bigeminum and that they represent a new genus of protozoon for which the name of Anaplasma is proposed, whose present species is to be called Anaplasma Marginale and the disease Anaplasmosis."

This parasite has always been considered to be of a protozoon nature. Its shape is that of a round or oval body, certainly resembling a coccus. Its multiplication seems to take place by fission. As a rule they are situated on the periphery of the corpuscle, sometimes reaching over the margin; they are also seen more towards the centre of the corpuscle, but not so frequently. They multiply rapidly and invade a large percentage of the corpuscles, amounting to about eighty per cent. in severe cases. The blood lesions stand in a certain relation to the number of parasites.

This discovery establishes a distinction among the many different names by which some of the cattle blood diseases of South Africa are known.

* * *

A quite startling fact in the article of Dr. Theiler, is that connected with the literature of Anaplasma Marginale where he demonstrates that this parasite is already well known, if it has not been recognized.

For instance, Smith and Kilbourne in "their studies on Texas fever have noticed them. The peripheral coccus-like bodies which they class as a stage of the cycle of piroplasma bigeminum" were undoubtedly Anaplasma Marginale. And Theiler argues that the term of "Texas fever" is a collective name for two different diseases, caused by two distinct parasites, the one due to piroplasma bigeminum and corresponds to red-water, the other to Anaplasma Marginale, identical with gall sickness."

Again: LA PLATA TRISTEZA, due to piroplasma bigeminum, has been studied by Knuth. He also saw peripheral bodies; he met them often. He also considers them as a stage in the cycle of piroplasma bigeminum. But all the facts that he relates correspond to those observed by Theiler, who comes to the conclusion that also, as with the name of Texas fever, must under that of Tristeza be understood two diseases: piroplasmosis and anaplasmosis.

Studying and writing their observations and experiments in Cachectical Piroplasmosis of the Transcaucasus, Luhs and Dschunskowsky attribute it to a small piroplasm, the *P. Annulatum*; and there peripheral bodies were also detected. For Theiler this form of piroplasmosis of Caucasus has no connection with an infection by *P. Annulatum*, but represents Anaplasmosis.

Finally, in the Hemoglobinuria of Europe, which is due to *P. Bovis* if peripheral bodies have been observed, they do not seem to have been described in England or on the Continent.

Following this interesting part referring to the literature of *Anaplasma Marginale*, the author completes his article by the description of the disease. Its geographic distribution, which tells us that it is found in various parts of the world, North and South America, all over Africa, in the Transvaal, etc., etc. The susceptibility of animals according to breeds, age. The variations of the virulence of certain strains of *Anaplasmas*. The immunity that follows a recovered attack, which, while it is not complete, shows that the animal has obtained a great resisting power. The length of the incubation varying between twenty-seven and thirty-two days, the recovery and the various forms of the disease. And then there is a minute description of the clinical symptoms which are those of anemia, to conclude with the pathological anatomy. In relation to the transmission of the disease, it is no doubt by means of the blue tick, *Boophilus decoloratus*, that it takes place.

There remain yet many points to determine and this discovery will necessitate new inquiries in relation to some diseases upon the nature of which definite conclusions had already been accepted.



ON BIER'S METHOD AGAIN.—Since the time when, in 1908, I related the application in *Veterinary Medicine* of this method, several publications referring to it have made their appearance in the REVIEW and other American printed documents, such as that of Dr. Harger and of Dr. Jensen in the proceedings of the

A. V. M. Association for the years 1908 and 1909. The question, therefore, seems pretty well understood and appreciated by the majority of our readers, who, no doubt, will now and then record in our pages the results of their experience. As after all the subject may yet not be very clear I may be permitted to mention what more recent statements have been advanced here.

First is the opinion of Professor Cadeac, of Lyon, in the *Journal de Zootechnie* where, after giving the history of the whole method, the mode of application, the indications, etc., he says: "The method appears to us as a perfect means to limit infection and to increase the bactericid and phagocytar power of the organism. The new elements thrown in the diseased field are not diseased phagocytes, weakened by the contact of toxines present in the entire organism, as in ordinary infections, where nothing arrests their resorption. They are strong fighters, present in an organism that has remained sound and that nothing has yet debilitated; they possess their maxima of destroying activity. They may be considered as invulnerable. Bier's method reinforces the physiological defensive action of the blood elements and of the serum towards infectious germs and their toxines. It acts like and exaggerates considerably the natural curative process that the organism disposes of towards bacterian infections." What a brilliant plea in favor of the method!

* * *

Let us, however, look at the other side of the medal, at the practical considerations of the learned professor and at the conclusions he draws from it.

After considering the modus operandi and the application of the ligature or bandage with the difficulties and dangers inherent to them, he says: "Evidently such a method is bound yet to remain localized in the hospital of veterinary colleges and private or military infirmaries. And I will add that it will always remains there as purely experimental as it requires too close and too severe watching in veterinary medicine to be of common application. In man, if the constriction is too great, he takes it off to relieve his pains and all complications are avoided. The

dog instinctively may tear it off with his teeth, the horse will struggle, but keep it."

Again: "Anyhow, its indications are more limited than veterinarians may imagine. The circulation cannot be disturbed with impunity without modifying the nutrition. The stagnation of the blood is followed with the throwing out of an exudate which forms an excellent medium of culture for all anaerobic germs; the constricting band, moderately tight, promotes a warm edema whose temperature is kept high only by the permanent arrival of oxygenated blood. The effects of this arrival are felt in parts slightly stretched, which are but little oedematous and beyond which the pressure of the exudate creates a much slower circulation; the tissues then become poor in oxygen, glucose is more abundant, so is also the glycuronic compounds, the toxines and the fermenting matters. And thus is created a medium extremely favorable to the development of all septic germs: Organisms most refractory to these infections are bound to succumb. Therefore, before applying the ligature, the nature of the germs which cultivate in the infectious centres ought to be known. If entirely aerobic, their evolution is arrested and prevented by a long constriction; if anaerobic they find in the warm oedema produced, a media most favorable to their growth and multiplication. In presence of the doubt, the risk of such danger cannot be run."

* * *

Those objections so well presented by Professor Cadeac, some of our collaborators, Professor Harger among them, in the article that he read in 1908 before the National Association mentioned them also. And yet let us show what results have been obtained by M. M. Lemire and Ductrototy, two army veterinarians.

In the extensive résumé of their experience they relate the history of 121 cases where Bier's method was resorted to and in which only eighteen failures were noted. The 121 cases and failures are recorded in toto as follows: Four cases of traumatic arthritis with two recoveries and two failures: three cases of

traumatic synovitis, with two recoveries; one plebitis of the saphena vein, recovered; twelve broken knees, with three failures; three punctured wounds of the foot, recovered; two lymphangitis, got well; one cartilaginous quittor also; twelve tendinous sprains with nine failures; one sprain of the fetlock, recovered; one hematic cyst, recovered; nine sore throat also; eighteen cases of pneumonia and pleuro-pneumonia with only one failure, and fifty-four cases of contused or punctured wounds with fifty-two recoveries and but two failures.

All these make a brilliant record to counterbalance the pessimism of Professor Cadeac. It is true, however, that the animals were treated and the results followed in military infirmaries being recorded by army veterinarians.

And now to conclude on this subject let me borrow from the *Revue Generale* a new application of the method, viz.: for the local treatment of rabies infection. The same being taken from the *Centralblatt für Bakteriologie*.

Ferni has said to have obtained good results in the treatment of rabies, a few hours after infection, by the application of an elastic band about the point of inoculation. All the animals treated, twenty-six rats, five rabbits and seven dogs escaped the disease, while all the controls died. According to Ferni the results are better than those that can be expected with cauterization.

Umberto Cano confirms these results in the treatment of rabies in dogs and rabbits. "Bier's hyperhemia is far superior to cauterization with the red iron." The band can be applied even four or five hours after the infection. Placed on between five and twelve hours, eighty-eight per cent. of the animals do not contract the disease, while the best results of the cauterization are only fifty-five per cent."

This is a valuable treatment which deserves attention.

* * *

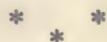
KNUCKLING AND ITS SURGICAL TREATMENT.—In previous chronicles I called the attention of the readers of the REVIEW to an improvement in the treatment of this deformity, suggested first by Mr. Breton, late adjunct professor of clinical surgery

at Alfort and which was afterwards applied by Professor Lienaux, of Bruxelles; and from an article recently published in our Italian contemporary, *Il Nuovo Ercolani*, I see its introduction by Professor Dr. Felice Cinotti, of the Pisa veterinary institute.

The improvement advocated by the French professor consisted in the association of median neurectomy to the tenotomy, so as to overcome in a permanent manner the deformity resulting from knuckling and consequently returned the animal to a proper condition for work.

"Indeed," says Breton, "resection of the median nerve must be the complement of the section of the perforans tendon, from the time the coronet has no longer its normal direction. By the simple tenotomy, the return of the knuckling is frequent and may be said must fatally take place, on account of the condensation of the cicatricial tissue, which, besides, often and for a long time after, remains the seat of pain and consequently of difficulty in the locomotion of the animal. This painful condition is the most severe reproach that can be made against tenotomy. For this reason and so as to avoid it neurotomy imposes itself."

Confirming those views, Lienaux adds to the description of one successful case in which he had performed both mesoneurectomy and tenotomy: "These fortunate results are due to the fact that the tendinous region had lost its sensibility, its soreness; there was no more pain, the animal rested his foot squarely on the ground, the leg stood in normal condition and the tendinous stumps kept properly apart during the entire length of the cicatrizing process, the cicatrix had the proper dimensions, and was better appropriated to the necessary length of the repaired tendon, while on the contrary, with the median left intact, the tendinous section, the strains upon the movable extremities, the inflammation following, all gave rise to pain, and instead of putting his foot well and flat on the ground, the animal holds it half flexed, a position which predisposes much to the return of knuckling."



Accepting all the reasons presented by Breton and Lienaux, Professor Dr. Felice Cinotti had decided to test the value of the two connected operations, but instead of operating on knuckling of fore extremities, he did it for the same condition on hind legs, performing the neurectomy on the sciatic nerve of the affected extremity. Neurectomy was performed first after anesthesia with stovaine and then open tenotomy, as recommended by some in preference to the subcutaneous operation.

Three animals were operated by Cinotti: A bay horse of fourteen years, for extreme knuckling of the left hind fetlock; a little donkey, eighteen months old, with slight knuckling of the left hind and excessive one of the right hind leg, and a bay horse, eight years old, for knuckling to the third degree of the right hind leg. This case was complicated with chronic thickening of the tendinous region and osteo-arthritis of the coronet. Besides the operation and according to indications, the orthosome of Vachetta, apparatus of support, was at times employed.

The first case was successful as far as the results of the operation went, but through some severe complications of gangrene by the improper application of the orthosome the case could not be considered as fully demonstrative.

In the donkey one leg only was operated and with such good results that the little fellow was able to perform good work for some time in a perfect condition. The owner was satisfied and preferred to wait until the other leg had become so bad that the animal could not be worked any more.

The third case was a perfect success and the animal, three months after, was doing good work.

The cases so far recorded by those surgeons established in a positive manner the benefits that can be obtained by the association of the two operations, one in fact completing the other and if it is not indicated in every case of knuckling, there are certainly many where the improved surgical treatment will find its positive and justifiable application.



CALVES CONGENITAL TUBERCULOSIS.—This important and interesting subject has received, at the hands of Dr. R. Rossi, a great deal of attention and his observations have been recorded in *La Clinica Veterinaria*, in a series of articles, where, while studying the causes of mortality among bovine foetuses, and new-born calves, he has brought out principally the question of congenital tuberculosis.

In 1908 he had seen eight cases of it. In two the foetuses were expelled by abortion after six or seven months of gestation; five were born one or two weeks before term; one was fourteen days old. All were delicate, emaciated calves or carriers of defects of conformation. The lesions consisted exclusively of white, fine granulations in the liver and hepatic glands, all of which were very rich in bacilli.

The autopsy of the mothers was made only in three: One had diffused general tuberculosis of both splanchnic cavities with healthy udders and glands. In another there was diffused thoracic tuberculosis with miliary nodules on the pleura and caseo-calcareous adenopathy of the mediastinal glands and also of the bronchial and superior cervical. The third cow presented serious pulmonary lesions with tuberculization of the thoracic and abdominal glands which were hypertrophied and caseous. There was no lesion of the genital apparatus nor of the udders.

Besides these eight cases of congenital disease with specific lesions, the author has witnessed the autopsies of a great number of calves, born before term which presented some organic alterations or malformations without specific characters and from which the influence of tuberculous infection could not be eliminated. It is generally admitted to-day that the transmission of tuberculosis from mother to offspring is done by heredo-contagion. The possibility of congenital tuberculosis cannot, however, be discussed. In veterinary medicine, the observations published, so rare before, are now more and more frequent. The author presents statistics of numerous observations recording 150 cases of tuberculosis in calves, which were considered as of congenital origin by those who observed them.

And yet the statistics made from cases in the abattoirs show that tuberculosis of calves is very rare. This is due to the fact that tuberculous lesions were overlooked and again that the subjects, such as still-born individuals, those that have died a few days after the extra-uterine life, those that have weak constitution, teratologic deformities or manifestations and in which tuberculosis is most frequent, are not subjected to necroscopic examination. Before Rossi, others, as Baumgarten, Johne, Bang, have called attention to the fact that such tuberculosis was more frequent than it was thought, and Klepp has published a classical example. In the space of eight years, this author had observed but nine cases of tuberculosis in calves. Afterwards, while making investigations upon tuberculosis of young animals, he found in the space of five months, twenty-six cases out of 4,068 autopsies of new-born subjects. And later, in one month, he gathered ten cases out of 847 examined.

The importance of those researches of Rossi is considerable to the point of view of the prophylaxy of tuberculosis.



VETERINARY INAUGURATION IN BELGIUM.—On the 14th of August the official inauguration of the new veterinary school of Bruxelles, took place and was the occasion for a professional manifestation; as besides it, the National Association, that is, the Medical Veterinary Federation of Belgium, was to hold its annual anniversary meeting.

The inauguration of the school, which, by the way, has been already in running order since last October, was celebrated in one of the halls of the school, where, besides the Faculty, were seated the Secretary of Agriculture and other celebrities of the profession in Belgium. Foreign organizations were also largely represented. Among those present there were: Professor Chauveau, the Inspector General of the French schools, representing the French government; the three schools of Alfort, Lyon and Toulouse had their representative, Directors Barrier, Arloing and Professor Bimes. From Germany there were Dr. Lydin,

of Baden, as president of the permanent committee of the International Veterinary Congresses; Director Dr. Baumann, of Hanover; Dr. Schimmel, of Utrecht, and Dr. Hutyra, of Budapest. There were also the president of the veterinary federation of France, Mr. Lucet, and Mr. E. Even, late of the Institute of Santa Catalina, and many others. Speeches were delivered as is customary on such occasions, and many interesting remarks were presented by the several speakers, who all promised for the new school a life of professional prosperity and usefulness.

The work done at the Federation was essentially of actual importance as most of the papers read and discussed were on sanitary subjects.

Altogether, the entire festival was a great success which, however, had an ending which might have proved most tragical, viz.: the burning of a portion of the International Exhibition, which was held at that time in Bruxelles.



BIBLIOGRAPHICAL ITEMS.—Among the publications issued by the Bureau of Animal Industry there is probably none which has the importance and value, to its special point of view, as the *Index Catalogue of Medical and Veterinary Zoology*, collected by Professor Ch. Wardell Stiles, Ph.D., and Albert Hassall, M.R.C.V.S., both of the division of Zoology of the Bureau.

The amount of work that has been required, that which the many patient researches have demanded, the arrangements of the subjects, of the names of the authors, all must have been enormous and the value of the whole work can only be appreciated by the careful examination of the contents of the various parts as they have been issued.

According to a fixed method adopted by the Bureau, in most of the works that it publishes, the *Index* is issued as bulletin No. 39, and so far 29 parts of them have been distributed. In each part are found the names of the authors, in alphabetical order, the title of their writings and the dates. The 29th is at the letter "S," and is paged 2326. Although the bulletins are not

for general free distribution, private copies can be obtained by purchasing them from the government printing office at Washington at very modest figures. When the *Index* is completed it will be one of the most valuable works for all scientists and specially those who are interested in Zoology.

* * *

ABSTRACT OF THE LABORATORY OF VETERINARY PHYSIOLOGY at the New York State Veterinary College was sent to me also. It contains an article on the Diastases in the Saliva of the dog and cat, by Ch. E. Hayden; one on the blood examination of Dermatoses in dogs, by Howard Welch, and three articles from Professor P. A. Fish. One on canine tetanus, another on a fly-blown and distempered dog, and finally the report of a case of auto-enterectomy in a bitch. She had her ovaries removed. On the second day after the operation she tore the stitches and was found with two free ends of the intestine protruding. After careful cleaning and amputation of a gangrenous piece of the intestines, the two intestinal ends were drawn together with Lambert's cat-gut sutures. Returned to her kennel, the slut was taken with nausea and emesis occurred. She vomited some blood clots and two pieces of the intestines, measuring fifteen and thirteen inches in length, making altogether, with the amputated gangrenous portion two and one-half feet of intestines removed. The patient did not survive the operation. This is certainly a very unique case—possibly the only one of its kind on record.

Among the pamphlets and journals that I have received are: The report of the Chief Veterinary Surgeon, J. D. Bortwich for the year 1909, from the Cape of Good Hope; the second part of volume IV. of *Zeitschrift für Wissenschaftliche und Praktische Veterinar Medicin*, published at the Veterinary Institute of Dorpat; the June and July numbers of the *Agricultural Journal of Good Hope*; from my friend Dr. Dalrymple, the proceedings of the 13th meeting of the Interstate Associations of Live Stock Sanitary Boards which was held in Chicago in September, 1909.

A. L.

ORIGINAL ARTICLES.

IMMUNIZATION OF CATTLE AGAINST TUBERCULOSIS.*

By E. C. SCHROEDER AND JOHN R. MOHLER, OF THE BUREAU OF ANIMAL INDUSTRY.

INTRODUCTION.

The heavy annual losses which are caused by the ravages of tuberculosis among the domesticated animals have been appreciated by the inhabitants of infected countries for many years. Owing to this realization of the extent of the havoc wrought by this insidious disease, earnest thought and study have been devoted by scientific forces in all civilized countries to the question of its eradication.

It was known from the first that the fight against tuberculosis among cattle would be a prolonged one because of the hidden manner in which the disease makes its attack. But when the suggestion was made that cattle might be safely and completely immunized against the disease, the advantages which might arise from this method of procedure became at once apparent. It is obvious that if the young animals of an infected herd or locality can be thoroughly protected from tubercular infection the root of the matter has been reached, and it is then only a question of time before the remaining animals can all be disposed of and the premises can be cleaned and disinfected and kept free from tuberculosis.

An appreciation of the advantages accruing from immunization in our tuberculous herds led the bureau to inaugurate the tests here recorded. It was clearly seen that it was most desirable to devise some method whereby cattle could be immu-

* Presented in connection with report of committee on diseases A. V. M. A., San Francisco, September, 1910.

* A detailed and comprehensive report of the results obtained in these series of investigations will be published shortly as a bulletin of the Bureau of Animal Industry in co-operation with our assistants, H. J. Washburn and W. E. Cotton.

nized rapidly and without danger to themselves or their attendants. Therefore a number of the most promising methods of applying the immunizing agent have been tried, and while none of them have proved perfect, some have been more or less efficacious in enhancing the powers of resistance of the animals treated.

REVIEW OF RECENT LITERATURE.

At the Ninth International Congress of Veterinary Medicine, held at The Hague in September, 1909, the subject of immunization against tuberculosis received most interested attention, and the papers which dealt with this question were actively discussed. Among the opinions which were expressed during this discussion, we quote from Dr. A. Eber, of Leipsic; Dr. J. F. Heymans, of Ghent; Dr. Klimmer, of Dresden; Dr. Vallee, of Alfort, and Dr. Arloing, of Lyon.

Dr. Eber stated that the following conclusions had been reached by him after careful study of the entire question, and after observing the results of numerous preventive inoculations:

"The receptivity of young cattle to experimental infection by virulent tubercle bacilli may be materially diminished by previous inoculation with the Koch bacillus, even of varied origin and virulence.

"The immunity thus conferred is not absolute. The immunized cattle will succumb from the effects of a sufficiently heavy dose of tuberculous virus.

"The increase of resistance is not complete for some time (at least three months) after inoculation and has entirely disappeared at the end of the first or second year.

"The degree and duration of the experimental immunity are influenced by the individual resistance, and up to a certain point by the quality of the vaccine used.

"No experimental method permits one to foresee the manner in which the vaccinated animals will comport themselves toward natural or enzootic contagion. Practice alone must decide the value of immunization in the struggle against bovine

tuberculosis. Tuberculin does not positively disclose the existence of tuberculous centres upon animals previously treated by injections of living tubercle bacilli.

"Science has not yet granted us a method of inoculation which permits effective struggle against tuberculosis in regions seriously infected.

"The new researches simply shed a light upon preventive inoculation when combined with other prophylactic measures (killing animals affected with open tuberculosis, raising the calves on sterilized milk, plowing pastures) during the struggle against tuberculosis.

"In practice one prefers methods of immunization which permit annual reinoculation. Nevertheless more exact researches must be instituted for the purpose of determining if annual preventive inoculation is sufficient in every case to confer satisfactory immunity.

"It is of great importance for the future to study farther the influence of the mode of inoculation (intravenous, subcutaneous, digestive) upon the quality and the duration of the immunity acquired, keeping constantly in mind at the same time the various doors of entrance of natural infection (digestive or respiratory)."

Dr. Heymans limited his report to a discussion of the method which he discovered and which consists in inserting into the animal vaccinated, the unattenuated tubercle bacilli enclosed in the interior of a dialyzing membrane.

Healthy animals thus vaccinated offer greater resistance to infection, whether by inoculation or stablign, than the checks. Although the duration and the degree of the immunity are limited the results obtained during four years upon more than 10,000 subjects have been most encouraging.

In practicing annually tuberculination and vaccination of all the cattle in contaminated stables, without separating the tuberculous from the non-tuberculous, and without heating the milk, 85 per cent. of the tuberculous centres have been practically wiped out after three or four years without the appearance of

any serious trouble during the experiment. Upon stables more seriously contaminated Heymans recognizes the fact that simple vaccination and tuberculinization are ineffective because the healthy cattle reinfect themselves in proportion to the intensity of the contagion. Upon such farms in addition to vaccination appropriate prophylaxis must be imposed.

The tuberculous cattle vaccinated and tested with tuberculin annually react less and less to the tuberculin and by the third application of the tuberculin test, 50 to 60 per cent. of them fail to show any thermic elevation whatever.

The results of more than 1,000 autopsies upon vaccinated cattle indicate that in general healthy cattle that have been vaccinated have remained immune to tuberculosis, and that the tuberculous animals, having ceased to react to tuberculin, present an arrested tuberculosis, even a regression, but the total absence of tuberculous lesions is exceptional.

In conclusion, Heymans states that his anti-tuberculous vaccination is a method practical and efficacious and taken together with prophylactic measures forms a valuable base in the struggle against tuberculosis, permitting one to struggle victoriously against this foe of our stables and this danger of infection to man.

Dr. Klimmer has examined the following methods of vaccination: First, the bovo-vaccination of von Behrings; second, the vaccination with tauruman of Koch-Schutz; third, the method of Heymans, and fourth, the method of Klimmer.

The method of Klimmer consists of vaccinating with attenuated human tubercle bacilli. The non-tuberculous animals are vaccinated twice during the first year and those that are tuberculous are vaccinated every three months. The following year all of the animals are vaccinated but once.

The activity of the preventive methods of von Behring and Koch-Schutz have proven practically inefficient. The reason is found in the short duration of the immunity which they procure and in the impossibility, while following sanitary regulations, of re-vaccinating either with the bovo-vaccine or the tauruman.

Klimmer claims that it is not possible at this date to estimate the curative value of the method devised by Heymans.

The method of Klimmer has not yet been sufficiently tested. Nevertheless, out of forty-three vaccinated animals which have been exposed, some of them during many years, to natural tuberculous contagion, there has not up to the present, a single one developed tuberculosis. Tuberculous young cattle have been vaccinated and from one to three years later have been killed, when autopsy has shown that the progress of the disease has been arrested, the tuberculous centres have become encapsulated and frequently calcified, and that there has been no formation of new tuberculous centres.

Dr. Vallee believes we must recognize that in spite of the enormous benefits realized on all sides, none of the proposed methods of vaccination has furnished definite results up to the present time. He states that:

1. Nevertheless the inoculation of cattle by any method with virulent human tubercle bacilli confers an appreciable resistance against various methods of experimental infection and also against natural contagion.

2. The resistance conferred is directly proportional to the quantity and virulence of the bacilli injected, but however great their value the immunity conferred by them does not persist longer than twelve to eighteen months.

3. The introduction of living bacilli as a vaccine contaminates the entire organism. This peculiarity necessitates a special guard over the animals immunized, should they be sent to slaughter during the six months which follow the last vaccination.

4. Whatever the mode chosen for introducing the vaccine, the resistance conferred is insufficient to assure the complete resorption of the bacilli inoculated for prolonging the immunity.

5. The resistance to infection by the digestive tube of the animal vaccinated by that method is incomparably superior to that acquired by animals by the intravenous method, because it permits the organism to obtain complete resorption of the viru-

lent material inoculated. Considering the frequency of infection through the digestive canal in cattle the application of vaccinating material through the mouth appears preferable to every other method.

6. Vaccination by the digestive method cannot be made entirely free from danger of infection if one uses virulent bacilli of the bovine type. The use of bacilli of the human type of slight virulence is therefore preferable as these furnish results comparatively equal to those of the bovine type.

7. Vaccination by way of the mouth is not easily obtained except upon very young subjects.

8. Vaccination by way of the mouth does not place the animals entirely beyond danger of infection with tuberculosis. It permits them to resist for more than a year contact with cattle which present open lesions of tuberculosis and following this present no lesions beyond insignificant tubercular nodules in the various glands. On this account it merits systematic study and further practical application.

9. The resistance conferred by subcutaneous methods is inferior to that obtained by way of the circulation.

10. Vaccination by the use of killed bacilli has given results inferior to those obtained with living and virulent organisms.

11. No definite conclusion can yet be actually formulated in regard to the various methods of immunization under discussion, but their systematic application will permit a determination of their real practical value.

The method of immunization proposed by Arloing does not exactly resemble any of the other systems which are at present in use. Most of these latter methods depend on the employment of attenuated tubercle bacilli, but the vaccines employed by Arloing are not composed of bacilli modified individually and ex temporeaneously either by heat or antiseptics, or by a passage through the organisms of cold-blooded animals. On the contrary, his vaccine contains living bacilli of bovine origin profoundly modified in their tubercle-producing power by a long series of cultures in the depth of glycerinated bouillon. The

modifications which they have taken on are henceforth fixed and of such a kind that these bacilli form races indefinitely transmissible. These races, comparable to the anti-anthrax vaccines of Pasteur, can no longer cause tuberculosis of the viscera and glands under the conditions where they are recommended to be employed. Being without danger to the monkey Arloing considers that they are also without danger to man. By their characters these vaccines are somewhat similar to the avirulent vaccines of Professor Klimmer, of Dresden.

They cannot cause any fatal infection in the ox, which is contrary to the bovo-vaccine of von Behring and the tauruman of Koch-Schutz, since these may be fatal to seven to eight out of every 1,000 subjects vaccinated.

Arloing concludes by stating that the phase of experimental research in tuberculosis vaccination is not closed, and it is to be hoped that by perseverance in laboratory studies the methods will be perfected and we will know better the conditions which follow and those which guarantee success. But such as they are to-day it would be negligent not to profit by the results acquired to try and restrain the ravages of bovine tuberculosis by associating vaccination with ordinary prophylactic measures as one does for other contagious maladies.

As a result of these various papers and the discussions which they elicited, the following resolutions of the Ninth International Congress held at The Hague in 1909 were adopted:

1. At the present time there is no vaccination which in itself is sufficient to combat in an efficient manner bovine tuberculosis in heavily infected herds.

2. In how far it is possible to bring about a more successful issue of the difficult struggle against bovine tuberculosis by a combination of vaccination with prophylactic and hygienic measures must be demonstrated by new practical experiments.

3. The Congress urgently requests the governments to grant the means for extensive experiments to examine the methods of vaccination against bovine tuberculosis under the different conditions of agricultural practice.

THE BUREAU EXPERIMENTS.

Probably no methods for the immunization of cattle against tuberculosis have been more widely discussed, or have given better results than those known as Pearson's and von Behring's. The two are practically alike, and consist of the intravenous injection of living cultures of human tubercle bacilli, of a virulence too low to cause a progressive tuberculosis in cattle. The tubercle bacilli are grown in artificial cultures, and, in a very finely subdivided condition, suspended in fluid, in definitely known quantities, are injected into a vein of the animal to be protected. The methods of bovo-vaccination of Pearson and von Behring were both tested, with what results will follow later.

In addition to studying the foregoing methods, attempts were made to cause immunity by subcutaneous injections of tubercle bacilli of different degrees of virulence as well as by transfusion of blood from artificially immunized to susceptible animals.

Finally a test was made of what is known as Heymans' capsule method of protective treatment, for the efficiency of which the discoverer, after applying it to a large number of animals in his own country, makes very strong claims.

TEST OF BOVO-VACCINATION ACCORDING TO THE METHOD OF VON BEHRING.

On June 2, 1906, the first nine calves, and on June 12, the tenth calf in the following list were given each an intrajugular injection of 3 c. c. of a suspension of tubercle bacilli of the human type. The tubercle culture used to make the suspension was "Case 30," and each c. c. of the suspension was equal to 0.0013 grams of tubercle bacilli.

Bull	Calf No. 427, about 2	to 2½ months old.
Bull	Calf No. 429, about 2	to 2½ months old.
Bull	Calf No. 431, about 2	to 2½ months old.
Heifer	Calf No. 432, about 2½ to 3	months old.
Heifer	Calf No. 435, about 2	to 2½ months old.
Heifer	Calf No. 436, about 2	to 2½ months old.
Bull	Calf No. 438, about 2	to 2½ months old.

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| Bull | Calf No. 439, about $2\frac{1}{2}$ to 3 months old. |
| Bull | Calf No. 441, about 2 to $2\frac{1}{2}$ months old. |
| Bull | Calf No. 444, about 3 to $3\frac{1}{2}$ months old. |

The ages of the calves as above given refer to the date on which the injections were made.

With the exception of a subsequent, short lived elevation of temperature, and the development of a small tumor in the skin over the jugular at the point of injection in several of the calves, the injections were followed by no marked adverse conditions.

On September 7, 1906, each of the ten calves was given a second intrajugular injection of tubercle bacilli prepared from culture "Case 30." The suspension used for the second injection, of which the dose was 3 c. c., represented 0.02 gram of tubercle bacilli per c. c.

The second injection was followed by a more marked elevation of temperature than the first, which may, in part at least, be attributed to the mechanical irritant action of the injected tubercle bacilli in the fine pulmonary capillaries.

Of the ten calves one, No. 444, was killed and examined post mortem without being exposed to tuberculosis, to determine what changes had been caused by the injections of tubercle bacilli it had received. The remaining nine were exposed to a tuberculous environment as follows:

- Nos. 427 and 432—October 30, 1906.
- Nos. 429 and 435—February 27, 1907.
- Nos. 431 and 436—April 25, 1907.
- Nos. 438 and 441—July 25, 1907.
- No. 439—November 8, 1907.

Control animals were added at the time of each exposure, but as a matter of convenience the controls will be treated separately, as such treatment will facilitate a better comparison between the several protective methods against tuberculosis tested.

The tuberculous environment to which the animals used in these experiments were exposed was a large cow stable with an

adjacent cow yard. In this stable and yard the infection was provided by a number of cattle affected with advanced tuberculosis, of which it was definitely known that they were freely expelling tubercle bacilli. In the yard, into which the cattle were turned daily for from two to eight hours, depending upon the state of the weather, all the cattle, treated, checks and diseased were allowed to mingle as they chose; in the stable the cattle were made to occupy stalls in such rotation that the exposure of the different individuals was equalized as much as possible.

The dates on which the ten calves were killed and a short memorandum of the lesions found on autopsy follows:

No. 444, treated, but not exposed, reacted to tuberculin on October 17, 1907 (13 months after last bovo-vaccination injection. Killed November 7, 1907. No lesions found, but firm pulmonary adhesions and one small glistening nodule, 3 m. m. diameter, in the lung. No tubercle bacilli on microscopic examination or animal inoculation were found in the minute glistening nodule, which may have been a small, healed tubercle, caused by bacilli from one of the intravenous injections.

No. 427, Killed April 23, 1908, after having been exposed to a tuberculous environment for about eighteen months. No lesions of tuberculosis.

No. 432, killed March 9, 1909, after having been exposed to a tuberculous environment over two years. No lesions of tuberculosis.

No. 429, killed July 16, 1909, after having been exposed to a tuberculous environment over two years. No lesions of tuberculosis.

No. 435, killed April 10, 1909, after having been exposed to a tuberculous environment over two years. One post pharyngeal gland twice the normal size and almost entirely tuberculous. No other lesion.

No. 431, killed March 25, 1909, after having been in a tuberculous environment almost two years. Mediastinal glands contain a number of minute necrotic foci, which failed to show the presence of tubercle bacilli on microscopic examination and

guinea pig inoculation. Lungs contain a number of minute areas which have the appearance of healing tubercles; no bacilli found in these areas.

No. 436, killed March 29, 1909, after having been in a tuberculous environment almost two years. No lesions of tuberculosis.

No. 438, killed April 10, 1909, after having been in a tuberculous environment over two years. No lesions of tuberculosis.

No. 441, killed April 9, 1909, after having been in a tuberculous environment over two years. Autopsy showed minute lesions in the azyagos lobe of lung and a small focus, 3 m. m. diameter in the right prescapular gland. No tubercle bacilli found in the lung lesions. The prescapular lesion showed tubercle bacilli on microscopic examination and guinea pig inoculation.

No. 439, killed March 29, 1909, after having been exposed about sixteen months to a tuberculous environment. Tubercles in the posterior mediastinal glands, which on guinea pig inoculation caused generalized tuberculosis.

TEST OF PEARSON'S METHOD.

On June 2, 1906, the first nine calves, and on June 12 the tenth calf in the following list were given each an intrajugular injection of 3 c. c. of a suspension of tubercle bacilli of the human type. The tubercle culture used to make the suspension was "Case 32," and each c. c. of the suspension was equal to 0.0013 gram of tubercle bacilli.

Heifer Calf No. 412, about 4 months old.

Heifer Calf No. 413, about 3 months old.

Bull Calf No. 425, about $2\frac{1}{2}$ to 3 months old.

Bull Calf No. 426, about $2\frac{1}{2}$ to 3 months old.

Bull Calf No. 428, about $2\frac{1}{2}$ to 3 months old.

Heifer Calf No. 430, about $2\frac{1}{2}$ to 3 months old.

Bull Calf No. 433, about $2\frac{1}{2}$ to 3 months old.

Bull Calf No. 440, about $2\frac{1}{2}$ to 3 months old.

Heifer Calf No. 442, about $2\frac{1}{2}$ to 3 months old.

Heifer Calf No. 445, about 3 months old.

The ages of the calves as given above refer to the date on which the injections were made.

On July 18, 1906, the ten calves were given a second intra-jugular injection of a suspension of tubercle bacilli in all respects relative to dose and strength, similar to the first injection.

On September 11, 1906, the calves received a third intra-jugular injection of a suspension of tubercule bacilli. The third dose like the other two was 3 c. c., but the suspension was stronger, 1 c. c. being equal to 0.02 gram of tubercle bacilli.

With the exception of some elevation in temperature, most marked after the third injection, the calves showed no pronounced symptoms as the result of the injections.

Of the ten calves one, No. 445, was killed and examined post mortem without being exposed to tuberculosis, to determine what lesions, if any, had been caused by the three injections of tubercle bacilli. The remaining nine calves were exposd to a tuberculous environment as follows:

- Nos. 412 and 425—October 30, 1906.
- Nos. 413 and 426—February 21, 1907.
- Nos. 428 and 430—April 25, 1907.
- Nos. 433 and 442—July 25, 1907.
- No. 440—November 8, 1907.

Control animals were added at the time of each exposure. The character of the tuberculous environment has already been described.

The dates on which the ten calves were killed and a short memorandum of the lesions found on autopsy follow:

No. 445, treated, but not exposed, reacted to tuberculin on October 17, 1907 (about thirteen months after last bovo-vaccination injection). Killed November 7, 1907. No lesions of disease.

No. 212, killed April 23, 1908, after having been exposed to a tuberculous environment about eighteen months. No lesions of disease.

No. 425, died December 18, 1906 after having been exposed to a tuberculous environment about six weeks. Cause of death, inflammation of the intestines. No lesions of tuberculosis.

No. 413, killed August 9, 1909, after having been exposed to a tuberculous environment over two years. No lesions of disease.

No. 426, killed April 1, 1909, after having been in a tuberculous environment over two years. Lungs were found to contain a few very minute tubercles.

No. 428, killed March 29, 1909, after having been in a tuberculous environment nearly two years. No lesions of tuberculosis.

No. 430, killed March 22, 1909, after having been in a tuberculous environment nearly two years. The pleura and mediastinal glands showed minute lesions closely resembling tuberculosis, but no tubercle bacilli could be found in these lesions by microscopic examination or guinea pig inoculation.

No. 433, killed July 16, 1909, after having been exposed to a tuberculous environment about two years. No lesions of tuberculosis.

No. 442, killed July 16, 1909, after having been exposed in a tuberculous environment about eighteen months. No lesions of tuberculosis.

No. 440, killed April 10, 1909, after having been exposed to a tuberculous environment nearly eighteen months. No lesions of tuberculosis.

VACCINATION BY SUB-CUTANEOUS INJECTIONS. INJECTIONS INTO THE END OF THE TAIL.

As the earlier investigations of the Bureau of Animal Industry on the subject of protective inoculations against tuberculosis (see Bulletin No. 52, Part III) had given results indicating that the degree of immunity conferred by the injection of living tubercle bacilli into the bodies of cattle depended rather upon the virulence of the injected bacilli than upon the method of injection or the number of injections, a series of tests were made relative to the effects from injecting cattle with quite virulent tubercle bacilli into a portion of the body, the end of the tail, from which the infection, with its strong tendency to become localized, would have to move some distance before it could

reach its favorite locations in the body. The end of the tail also offered the advantage that the character and progress of the inoculation disease could be watched and that treatment, surgical if necessary, could be applied.

On June 20, 1906, the following four calves received each a sub-cutaneous injection, immediately above the brush at the end of the tail, of 3 c. c. of a suspension of bovine tubercle bacilli. The tubercle culture used was "Bovine III." and each 3 c. c. of the suspension was equal to 0.01 gram of tubercle bacilli.

Heifer Calf No. 447, about 3 months old.

Heifer Calf No. 448, about 3 months old.

Bull Calf No. 450, about 3 months old.

Bull Calf No. 451, about 2½ months old.

The tuberculous disease caused in the tails of the animals varied considerably. In one case, No. 447, it was necessary to amputate the tail. The four animals were exposed to a tuberculous environment beginning sometime after the protective injections had been made; later on, when they were killed and examined post mortem, all, with the exception of No. 450, were found to have tuberculous lesions directly traceable to the tubercle bacilli injected into the ends of their tails, proving definitely that the strain of tubercle bacillus used was too virulent for the injection of calves in any manner.

Calf No. 450, after remaining in a tuberculous environment for several years, was found on autopsy to be in excellent condition and entirely free from lesions of tuberculosis.

On June 20, 1906, the following five calves received each a subcutaneous injection, immediately above the brush at the end of the tail, of 3 c. c. of a suspension of virulent, human tubercle bacilli. The tubercle culture used was "Boy V.," and each c. c. of the suspension represented 0.01 gram of tubercle bacilli.

Heifer Calf No. 449, about 3½ months old.

Bull Calf No. 452, about 2½ months old.

Bull Calf No. 453, about 2½ months old.

Bull Calf No. 454, about 3 months old.

Heifer Calf No. 455, about 3 months old.

With the exception of a slight swelling at the seat of injection, which gradually subsided, the treatment received by the calves caused no visible lesions.

Some time after the protective injections were made the calves were exposed to a tuberculous environment, and later on killed and examined post mortem.

Calves Nos. 449 and 453 showed no lesions of tuberculosis either as a result of the protective injections or the exposure.

Calves Nos. 452 and 454 showed a small tuberculous abscess at the seat of inoculation in the tail and small tuberculous foci in the coccygeal lymph glands (the lymph glands located near the root of the tail), and no lesions as a result of the exposure to tuberculosis after the protective injections had been made.

Calf No. 455 was found on autopsy to have tuberculous lesions in the coccygeal and pharyngeal lymph glands, or, in other words, to have contracted tuberculosis both from the protective injection and subsequent exposure.

All the tuberculous lesions found were small, but cattle Nos. 452, 454 and 455 show conclusively that the strain of tubercle bacillus injected was too virulent to be used for immunizing purposes. Cattle Nos. 449, 452, 453 and 454 indicate that even a subcutaneous injection of tubercle bacilli can protect against subsequent exposure to a tuberculous environment, and No. 455 shows that a tuberculous process induced by inoculation does not necessarily, in all instances, protect against fresh infection from without, and this is one of the most important facts with which we have to deal in the question of bovo-vaccination.

On November 14, 1906, the following cattle received each a subcutaneous injection, immediately above the brush at the end of the tail, of 3 c. c. of a suspension of bovine tubercle bacilli. The tubercle culture used was "Bovine III.," and each c. c. of suspension was equal to 0.01 gram of tubercle bacilli.

Heifer No. 406, about 18 months old.

Heifer No. 386, about 16 months old.

Cow No. 336, about 3 years old.

Cow No. 215, about 6 years old.

One of the above animals died about four months after injection, cow, No. 336, without additional exposure to tuberculosis. The cause of death was inflammation of the intestines, but she showed a well-marked tuberculous lesion in her tail at the seat of injection and tuberculous lesions in four mediastinal glands. All other parts of her body were free from tuberculosis.

Heifers Nos. 406 and 386, and cow No. 215 were killed after having been exposed to a tuberculous environment for quite a long time, and showed tuberculous lesions which may have been caused in part by the exposure and which were certainly caused in part by the injection of tubercle bacilli.

INJECTIONS UNDER THE SKIN OF NECK.

On June 21, 1906, the following five calves were each injected with 3 c. c. of a suspension of virulent human tubercle bacilli. The dose in each case was divided into two parts, and one part introduced under the skin on the right side of the neck, and the other part under the skin on the left side of the neck. Each 3 c. c. of the suspension injected represented 0.01 gram of tubercle bacilli.

- | | |
|--------|------------------------------------|
| Bull | Calf No. 456, about 2½ months old. |
| Bull | Calf No. 457, about 3 months old. |
| Bull | Calf No. 458, about 2½ months old. |
| Heifer | Calf No. 459, about 2½ months old. |
| Heifer | Calf No. 462, about 2½ months old. |

Calves Nos. 458 and 462 died in about two months as a result of tuberculosis caused by the injections of tubercle bacilli. The remaining three animals were exposed to a tuberculous environment for some time and subsequently killed and examined post mortem. All showed extensive lesions of tuberculosis, no doubt almost entirely due to the injections of tubercle bacilli, showing that either this method of treatment was too severe or that the culture of tubercle bacilli used was too virulent.

In addition to the foregoing subcutaneous injections, six calves were given each two successive injections of virulent

tubercle bacilli, with an interval between the two injections. These calves all contracted tuberculosis from the treatment received, and simply emphasize that subcutaneous injections, no matter what part of the body is used as the seat of injection, are dangerous when the bacilli injected have a true virulence for cattle. In a later, fuller report on this work it is hoped that the lesions caused by the various injections may be given and discussed in detail.

Among the subcutaneous injections, only those made into the ends of the tails of calves 449, 452, 453, 454 and 455, with virulent human cultures, hold out any encouragement that a subcutaneous method of protective inoculations against tuberculosis can be developed. The results with these animals, however, are quite encouraging, and merit that successive injections, into the tails of cattle, beginning with quite avirulent cultures, should be tested.

CHECKS OR CONTROL ANIMALS.

The following eleven untreated cattle, which were similar in age, size and condition to those given intravenous protective treatment according to the methods of Pearson and von Behring, were exposed for the same length of time to the same tuberculous environment to which the treated or protected animals were exposed. For the sake of brevity only a sufficient account of these animals will be given now to show that the environment contained the necessary amount of virulent, infectious material to cause tuberculosis of most cattle exposed in it.

Heifer No. 471 contracted tuberculosis of the mediastinal and mesenteric glands.

Heifer No. 472 contracted tuberculosis of one post-pharyngeal gland.

Heifer No. 475 contracted tuberculosis of the mediastinal glands.

Heifer No. 526 contracted tuberculosis of the mediastinal glands.

Steer No. 530 contracted tuberculosis of the lung and mediastinal glands.

Steer No. 531 remained healthy.

Heifer No. 539 contracted tuberculosis of one post pharyngeal gland.

Heifer No. 540 contracted generalized tuberculosis.

Heifer No. 570 contracted tuberculosis of the mediastinal glands.

Bull No. 573 contracted tuberculosis of the lung and mediastinal glands.

Cow No. 579, remained healthy.

Of course it is to be understood that these cattle were carefully tested with tuberculin and found to be free from tuberculosis before they were exposed as control animals in the experiment. It is desired to avoid all detail not to some extent essential for a general statement in the present report. In the ultimate, full report which the Bureau of Animal Industry will publish, the complete history of each and every animal will be given.

In addition to the check or control cattle specially related to the tests of the Pearson and von Behring methods of bovo-vaccination, three other check animals were also introduced into the same tuberculous environment which was in all instances used as the means to test the amount of immunity acquired by the treated animals in these series of experiments.

The three additional animals are Nos. 477, 484 and 549, and all three contracted tuberculosis as the result of the exposure, giving a total of fourteen checks or controls of which twelve became infected with tuberculosis, thus showing that the character of the exposure to which the treated cattle were subjected was quite severe. The time at which the various control animals were introduced into the tuberculous environment, and the length of time they were permitted to remain in it, was carefully planned in connection with the exposure of the treated animals so that any failure among the latter to become infected could be properly valued through a comparison of the treated with the control animals.

One statement which has an important bearing on the intravenous methods of producing resistance against tuberculosis must

be added here. All our cattle treated with intravenous injections of tubercle bacilli showed, on careful post mortem examination, some pulmonary lesions, like thickening of the pulmonary connective tissue, adhesions between the lobes of the lungs and of the lungs to the chest wall and diaphragm, to be sure only very slight in most instances, but which could be accounted for in no other way than as remnants of the disturbance caused by the injected bacilli. This alone constitutes a condition which should receive further attention before a system of bovo-vaccination requiring the intravenous injection of living cultures of tubercle bacilli is practiced on a wholesale scale, and in conjunction with what we know about the retention of tubercle bacilli in the tissues after injection and the uncertainty about the manner and state in which they leave the body, should teach us to proceed cautiously in the adoption of protective methods, notwithstanding the fact that the results obtained prove conclusively that actual, strong resistance to tuberculosis can be established by using them.

COMPARISON OF THE FOREGOING METHODS.

From the brief records that have been given we see that three of the nine cattle treated according to the method of von Behring and afterwards exposed contracted tuberculosis, that one of the nine cattle treated by the method of Pearson and afterward exposed contracted tuberculosis, and that of fourteen checks or untreated control animals twelve became infected on exposure.

Of the eight animals that received injections of bovine tubercle culture subcutaneously into the ends of their tails, four old and four young animals, all but one young animal contracted disease as the result of the injections. The one that escaped disease from the injection also resisted tuberculosis on exposure.

Of the five cattle that received human culture injections into the ends of their tails, two became immune without inoculation disease, two were immune but had slight inoculation disease, and one had both inoculation and exposure disease.

The injection of tubercle cultures under the skin of the neck of animals caused them all to contract tuberculosis.

The several methods may be compared as follows:

von Behring Cattle....	66 2/3 %	Successfully protected for a period approximating two years.
Pearson Cattle.....	88 8/10%	
Bovine Cultures, Tail..	12 1/2 %	
Human Cultures, Tail.	40%	
Injections Under Skin.	0%	

The human cultures, tail, it should be borne in mind, actually protected eighty per cent. of the cattle treated against the infection in the environment to which they were exposed.

The above percentages can best be valued by comparing them with the check or control animals, among fourteen of which, only two, or fourteen and two-sevenths per cent. escaped.

If the only question to be considered in connection with bovo-vaccination was the protection of cattle against tuberculosis the foregoing results would give us excellent reasons to be very cheerful. Lately, however, studies made by various investigators on the elimination of tubercle bacilli after injection from the bodies of animals, teach us to be very careful about adopting methods of immunization for purely economic purposes that may be dangerous for those who afterwards use the products of the treated animals.

The work of the Bureau in the past has also demonstrated that tubercle bacilli injected into the circulation or under the skin of cattle may remain incorporated in their tissues for long periods of time with only a gradual or very slow loss of virulence. These are important factors that must not discourage further work to build on the knowledge we have gained, but which must be kept in mind and be permitted to have their due influence on our subsequent investigations.

Very careful autopsies of cattle treated by intravenous inoculations of tubercle bacilli according to the methods of von Behring and Pearson, show that the more or less attenuated tubercle bacilli that engender immunity against tuberculosis rarely leave the treated subjects wholly free from lesions that can be accounted for in any other way than as due to the

pathogenic activity within the animal's body of the injected bacilli.

TEST OF HEYMANN'S METHOD OF BOVO-VACCINATION.

A protective treatment for cattle against tuberculosis, named the Heymann's method after its inventor, has received quite a little attention during the last few years. The technique of this method was demonstrated in America by Professor Heymann, of Belgium, himself during the meeting of the International Congress on Tuberculosis at Washington, D. C., in 1908, and the efficiency of the method has been carefully tested by the Federal Bureau of Animal Industry with cattle and hogs.

Heymann's method, briefly, is the introduction of virulent bovine tubercle bacilli, enveloped in a closed sack of vegetable fibre which in turn is inclosed in a gelatin capsule, under the skin of the animal to be protected. The supposition is that the vegetable sack will confine the tubercle bacilli at the seat of inoculation and that the treated animal will be immunized by protective fluids that form within the closed vegetable sack and pass outward from it, into the animal's system generally, by an osmotic process. The closed sack of vegetable material in combination with the gelatin capsule are commonly known as Heymann's capsule.

In the fall of 1908 twelve cattle and ten hogs were inoculated with Heymann's capsules. The animals were divided into three groups, and one group of hogs and cattle was exposed immediately after treatment to a tuberculous environment, a second about two months later and a third about two months after the second. With each group of hogs a similar number of untreated hogs were exposed as checks.

As the cattle and hogs were exposed in the same tuberculous environment in which the degree of immunity acquired by all the other bovo-vaccinated animals discussed in this paper was tested, no checks were really necessary for the Heymann's treated cattle. The checks on the other experiments were serviceable for this one also, but nevertheless for additional cattle as special

checks on the value of Heymann's method were added to the already large number used to prove the character of the tuberculous environment to which exposure was made.

Among the Heymann's treated hogs one contracted generalized tuberculosis from the treatment and one died prematurely as the result of an injury. When the remaining eight hogs with their ten checks were killed, after an exposure to natural infection varying from eight months to a year, all the principals and checks were found to be affected with tuberculosis, not one of either lot has escaped the disease, and the lesions in the treated animals were in no respect different from those found in the checks. Hence, it is very clear that Heymann's method is absolutely worthless for hogs.

Among the twelve cattle treated one died prematurely and the remaining eleven, when they were killed and examined post mortem, all showed lesions of tuberculosis, and the lesions were very similar to the tuberculous lesions found in the four cattle that served a special checks on the Heymann's capsule cattle. One of the treated animals showed tuberculosis directly traceable to the capsule with which it was inoculated for protection. Hence, as with the hogs, the only conclusion that can be drawn with the cattle is, that Heymann's capsule method of bovo-vaccination is inefficient.

In order to test the claims made by Professor Heymann that the vegetable sack, in which he incloses the tubercle bacilli used in his method of bovo-vaccination, would not permit the passage of bacteria, a number of sheep were inoculated with anthrax bacilli inclosed in Heymann's capsules. The sheep rapidly contracted and succumbed to anthrax, and the anthrax bacilli (which are larger of course than tubercle bacilli) were proven to have escaped through the walls of the capsules and to have gotten into the blood circulation. Blood examined from the tips of the ears of the sheep showed numerous anthrax bacilli. We may conclude from this the fact that tubercle bacilli introduced under the skin in Heymann's capsules are frequently restrained at the point of inoculation, depends upon other condi-

tions than the inability of the germs to pass through the walls of the vegetable sack in which they are enveloped.

BLOOD TRANSFUSIONS.

It may be of interest to add in a short note that blood transfusions from highly immunized cattle, into tuberculous cattle for curative purposes and into healthy cattle in order to make them resistant to tuberculosis, have been tested on a small scale. The idea that such transfusions may give good results originated with the eminent surgeon, Dr. Geo. W. Crille, of Cleveland, Ohio, who personally made the various transfusions required in the experiment.

The blood for the transfusions was supplied by cattle that had been immunized by the methods of Pearson and von Behring, and which had resisted infection after a long-continued exposure to the tuberculous environment previously described, in which about eighty-six per cent. of all exposed, untreated or check cattle, contracted tuberculosis.

As far as the very small number of cattle used justifies drawing conclusions, it is regrettable to report that the blood transfusion experiments gave wholly negative results, and hold out no encouragement as being a means by which tuberculosis can be treated or the resistance to infection strengthened. The treated animals may have been too far advanced in the disease to derive benefit from any form of treatment, but the animals which received blood to immunize them apparently were as susceptible to infection as those that had received no treatment.

GENERAL CONCLUSION.

The only conclusion to which we are entitled from this work and the careful studies of the writings of others that we have made of the subject of protective inoculation against tuberculosis may be stated as follows: Though results have been obtained which are very encouraging to the investigator and which prompt him to strive onward with renewed vigor and hope, *no system of bovo-vaccination has reached a stage at the present time that justifies its use in common practice.*

EXPERIMENTS WITH THE INTRADERMAL TEST FOR TUBERCULOSIS IN CATTLE.*

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The application of the classical subcutaneous tuberculin test to range cattle under range conditions is impracticable. The excitement resulting from the necessary frequent handling makes temperature records valueless. This is unfortunate in two respects. First, it prevents the possibility of reducing the number of tubercular animals on the range by sending diseased ones to the abattoir for slaughter under competent inspection. Second, it prevents the exportation of certain desirable breeding animals to countries requiring the tuberculin test as a prerequisite to shipment.

The intradermal test described by Moussu and Mantoux† seemed to us to be peculiarly adapted to the testing of range cattle. These authors point out that the test consists of the injection intradermally of one to two tenths c.c. of a ten per cent. dilution of crude tuberculin. This produces in positive cases, an edematous swelling at the point of injection, which reaches its maximum at forty-eight hours. In non-tubercular animals there is no such swelling.

For the point of injection they select one of the two folds of skin (sub-caudal folds) which are found underneath the tail.

* Presented to A. V. M. A., San Francisco, Sept., 1910.

† Moussu et Mantoux. Sur l'intra-dermo-reaction à la tuberculine chez les animaux
Transactions of the Sixth International Congress on Tuberculosis, vol. four, part two, page
831.

when it is lifted. This location is admirably adapted to the test for the skin is bare, soft and pliable, so that the slightest edematous infiltration is noticeable on palpation. Those writers state that if the result is positive it suffices by elevating the tail to observe that the sub-caudal fold is increased to double or triple its normal thickness. The corresponding fold not injected, remains normal and affords a convenient standard for comparison. Ordinarily there is produced in the region of the point of injection an edematous infiltration which takes an oval form, and attains the dimensions of a hazelnut, an almond or a walnut. In other cases the infiltration extends along the fold transforming it into a thickened, elongated cushion.

Those writers claim that this local reaction does not usually cause any general disturbance, little or no fever, no loss of appetite, little or no loss of milk. It develops without any change in the ordinary conditions in the life of the animal and without its being necessary to take any special precautions. They maintain that it has none of the disadvantages of the ophthalmic and cuti reactions and presents all of the advantages of the subcutaneous injection of tuberculin. It reduces the obligations of the operator to the minimum by dispensing with every preparatory or supplementary measure (taking of temperature, denudation of skin, etc.).

INTRADERMAL TEST ON ONE HUNDRED COWS WITH AUTOPSY.—Through the kindness of Miller and Lux, Inc., one hundred head of range cows, shipped to their abattoir for slaughter, were placed at our disposal for the purpose of studying this test. These cows were subjected to the test and afterward slaughtered to check the accuracy of the diagnosis.

The requirement that the tuberculin be injected between the layers of the skin necessitated the use of a very fine short hypodermic needle. We used a one c.c. hypodermic syringe, graduated to minims, of a type used by dentists. We found the kind of tuberculin specified by Moussu and Mantoux in the stock of the Cutter Laboratory, Berkeley. It bore this label: "Tuberculin. O. T. (Original) Serial Dilution No. 5. 1 c.c. contains

100 mg." The dose uniformly administered by us was a trifle over 3 minims, the equivalent of 2-10 c.c.

In making the injection the cows were run, one at a time into a chute, which was just long enough for one animal. The rear end of the chute was closed by one bar placed immediately above the hocks. Animals, especially wild, were held against this bar by a lariat around the horns and stretched taut by a vaquero and horse. The operator stood squarely behind the animal in making the injection. The right subcaudal fold was pulled out to view with the left hand and held while the injection was made with the right hand. No precautions were taken to prevent infection at the site of injection and no evidence was found to indicate danger in this technique. In making the injections we felt the need of a syringe having a gauge on the piston, so that the work could be done quickly without the necessity of watching the graduations while injecting.

In one instance the injection was made while the animal was thrown and held by two vaqueros as is usually done in branding on the range. This circumstance illustrates the fact that a chute is not absolutely necessary.

Forty-eight hours after injection, the cows were again run through the chute and roped to facilitate careful examination. The operator standing immediately behind the animal, lifted the tail to a horizontal position with one hand and with the other compared the thickness of the two subcaudal folds. At this time the animals were marked with ear tags to ensure identification on the killing floor.

On completion of the examination, the cows were driven to the abattoir and slaughtered immediately. The regular routine of federal inspection, involving an examination of all the viscera, all the visceral lymphatic glands, and all the superficial body glands, was followed, the auxiliary and popliteal glands being the only ones not reached.

The following table contains the records of all animals in the series which gave certain or doubtful reactions and all those which showed tubercular lesions:

TABLE I.
Results of Intradermal Test and Autopsies.

		Results test.	Results autopsy.	Cervical.	Bronchial.	Prescapular.	Mediastinal.	Portal.	Mesenteric.	Iliac.	Ext. Inguinal.	Int. Inguinal.	Precrural.	Sublumbar.	Supra mammary.	Lungs.	Liver.	Pleura.	Peritoneum.
1.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
2.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
11.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
12.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
14.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
17.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
23.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
26.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
28.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
29.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
31.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
34.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
37.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
38.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
40.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
41.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
42.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
44.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
46.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
47.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
48.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
48.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
51.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
53.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
54.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
55.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
57.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
59.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
61.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
62.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
75.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
76.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
77.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
87.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
88.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
90.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
91.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
92.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
96.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
99.		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
100.	*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

* No. 90 Autopsy notes lost

As a result of these autopsies we confirmed twenty-eight out of thirty cases which we had considered to be positive reactions. Of four reactions which we considered questionable, three proved positive on post-mortem. In two that we considered positive no lesions were found. Fifty-nine, which we considered non-reactors, proved negative on autopsy. Seven that we considered as negative showed lesions. We believe that with our present knowledge and experience the number of those diseased and classed as negative would be very materially reduced.

In judging what constitutes a reaction one must differentiate between the slight thickening which nearly always is noticeable at the forty-eighth hour, and the edematous infiltration characteristic of a reaction. The former is described by Mossu and Mantoux as the size of a grain of wheat. In our experience, such nodules, if spherical, and less than a quarter of an inch in diameter, have not been significant. We have found these small nodules to be always much firmer than the diagnostic edematous enlargement.

The significant edematous swelling varies slightly in general conformation. In some cases it assumes a spherical form and any such swelling one-half inch in diameter or over should be regarded as a positive reaction. We have observed such swellings approximately two inches in diameter. In other cases a reaction is indicated by a more or less oval or circular flattened edematous mass about the size of a quarter dollar and twice the thickness of that coin. These flattened infiltrations may reach the size of a dollar and double its thickness.

Our experience has indicated that there is difficulty in interpreting the significance of a swelling varying from a quarter to a half inch in diameter. We encountered two animals whose swellings were of this size. One of them proved on autopsy to be a generalized case with widespread miliary lesions. The other showed no lesions on autopsy.

We did not observe any relationship between the character of the reaction and the lesions. One of our questionable reactions proved to be a well advanced generalized case. The only

case of miliary tuberculosis found on autopsy gave a reaction, a swelling somewhat less than half an inch in diameter. Numerous cases giving a more pronounced reaction than this showed very small insignificant lesions on post mortem.

The class of animals experimented upon and the conditions under which the work was done precluded the possibility of observing some of the points emphasized by Moussu and Mantoux. We did not study the immediate effect of the injection, its effect on temperature nor milk supply, nor the persistence of the swelling beyond the forty-eighth hour.

The hundred animals used for the experiment were taken at random from shipments of range stock, cut out for slaughter, and were all in good condition. They were not specially selected.

The fact that thirty-eight per cent. of range cows showed lesions of tuberculosis should not escape attention. It indicates that tuberculosis among range cattle is a really serious problem. In the regular work of federal inspection among all classes of range stock in California, steers, bulls and cows, there is found a large and constantly increasing percentage of tubercular animals.

We believe this experiment shows that the intradermal test furnishes the only means at present available for the solution of this problem. The difficulties of reducing the percentage of tuberculosis among range animals by the use of this test should be much less than those usually encountered in similar work among dairy stock. Since range stock are primarily intended for slaughter, owners should not object to testing their herds and consigning the reactors to the abattoir. By this means the foci of infection on the range would be reduced. Also, the percentage of condemnations on the killing floor of individuals so slaughtered, would be materially lessened after the first test.

COMPARISON OF THE SUBCUTANEOUS AND INTRADERMAL TESTS WITHOUT SLAUGHTER.—Opportunity was afforded us to apply the intradermal test to a dairy herd of twenty-seven ani-

TABLE II.
Comparison of Subcutaneous and Intradermal Tests.

No.	Subcutaneous.		January 17, 1910.		Hour After Injection.		Intradermal.	
	Initial temperature.*	8th.	10th.	12th	14th.	16th.	18th.	20th.
1.....	102.7	103.1	101.8	101.8	101.6	101.2	101.6	102.2
2.....	101.6	101.9	101.8	101.4	101.6	101.2	101.5	101.5
3.....	103.7	101.0	101.4	102.7	106.4	104.7	104.5	104.8
4.....	101.5	102.0	102.6	102.8	103.0	103.8	105.0	104.8
5.....	101.9	101.8	101.0	101.6	101.0	102.2	101.3	101.4
6.....	101.5	101.5	101.7	101.6	100.8	101.8	101.3	101.3
7.....	102.3	102.0	101.6	101.5	101.2	101.0	104.0	104.4
8.....	102.6	102.5	101.6	101.5	101.2	101.9	103.0	104.2
9.....	101.8	101.9	101.6	101.4	101.3	101.0	101.2	101.3
10.....	102.1	101.5	102.4	103.4	104.9	105.0	106.0	104.3
11.....	101.8	101.8	101.0	101.5	101.1	100.9	100.7	101.1
12.....	102.7	103.0	102.6	101.6	102.4	102.6	105.6	105.9
13.....	102.4	102.0	101.6	101.4	102.0	104.4	103.8	103.3
14.....	101.5	101.5	102.7	101.6	101.4	101.2	101.8	101.2
15.....	102.8	101.9	101.5	101.5	100.6	101.8	102.0	102.0
16.....	101.8	101.6	101.6	101.6	100.5	100.8	101.8	104.0
17.....	101.6	101.4	101.6	101.7	104.0	105.2	103.8	105.3
18.....	101.4	101.8	101.8	101.6	102.9	102.0	102.0	102.8
19.....	101.5	102.5	102.4	103.0	105.4	104.0	102.7	102.5
20.....	101.8	102.2	101.0	101.8	104.2	100.8	101.8	101.3
21.....	104.0	103.8†	102.4	101.4	101.2	100.5	102.8	101.7
22.....	103.5	102.1	102.4	101.4	101.2	100.5	102.8	101.7
23.....	103.7	103.5†	101.6	101.8	106.3	105.7	105.1	104.8
24.....	101.8	102.0	101.6	101.8	101.5	101.3	102.2	102.1
25.....	101.8	102.5	101.3	101.5	101.6	102.4	102.3	102.1
26.....	103.3	103.0	102.3	101.8	101.8	101.0	101.3	101.8
27.....	101.9	101.4	101.0	101.1	101.1	101.0	101.3	101.8

* The initial temperatures were taken two hours previous to and at the time of injection. The dose was two c. c.

† Not injected on account of high initial temperature.

mals seventy-six days after the herd had been subjected to the subcutaneous test. The results of both tests appear in Table II.

It was possible to compare the results of the two tests on twenty-five animals. There was total agreement in twenty-one cases. Of these, ten were positive and eleven were negative. One animal reacted to the subcutaneous test, but not to the intradermal test. Three reacted to the intradermal test that had not reacted to the previous subcutaneous test. This does not necessarily indicate a disagreement, as there is the possibility that infection may have occurred subsequent to the first test.

In making these comparisons we used scrupulous care to exclude any knowledge of the results of the previous subcutaneous test that might influence our judgment in applying the intradermal test. We compared results only after reaching a decision on the intradermal test.

COMPARISON OF SUBCUTANEOUS AND INTRADERMAL TESTS WITH SLAUGHTER.—We are indebted to Dr. C. M. Haring, of the University of California, for opportunity to apply the intradermal test to some cattle previously tested by him with the subcutaneous method, and to check the results by autopsy. The results of the two tests and the autopsy are embodied in Table III.

This shows an agreement in seven of the eight cases, six positive and one negative. One case, number four, which did not react to the subcutaneous test, did react to the intradermal and proved positive on autopsy. This one, of course, might have been infected subsequent to the subcutaneous test.

INTRADERMAL TEST IMMEDIATELY FOLLOWING SUBCUTANEOUS TEST.—Opportunity was afforded to apply the intradermal test to a dairy herd of twenty-two animals five days after the subcutaneous injection of tuberculin. Four had reacted to the subcutaneous test, but none reacted to the intradermal test. The four reacting animals and one non-reactor were slaughtered. The autopsy proved the accuracy of the subcutaneous test.

TABLE III.
Comparison of the Subcutaneous and Intradermal Tests Checked by Autopsy.

No.	Subcutaneous.			Intradermal.							
	Initial temperature.*	January 4, 1910.	8th.	10th.	Hour After Injection, 12th.	14th.	16th.	18th.	20th.	Result.	Autopsy.
1.....	103.3	103.2	101.8	102.6	104.2	104.8	104.3	104.5	104.9	+	+
2.....	102.6	102.4	101.8	102.2	103.6	104.6	104.7	104.8	104.0	++	++
3.....	102.3	102.6	102.2	100.6	102.5	103.3	104.6	104.2	104.0	++	++
4.....	102.8	102.8	102.6	102.8	101.0	102.4	101.6	101.6	102.0	-	+
5.....	102.0	101.6	102.4	102.0	101.6	101.8	102.3	101.4	102.2	-	-
6.....	101.3	103.6	104.4	106.2	105.2	105.8	104.9	104.6	104.6	++	++
7.....	102.4	102.4	105.8	105.6	106.1	105.9	104.0	102.4	101.1	....	++
8.....	103.3	103.0	104.0	103.6	103.5	102.2	102.4	102.4	101.1	....	++

* The initial temperatures were taken two hours previous to and at the time of injection.

The results point emphatically to the conclusion that a recent subcutaneous test interferes with the intradermal test.

SUMMARY.—1. We have shown that twenty-eight out of thirty reactions regarded by us as positive, proved positive on autopsy. Of four considered questionable three proved positive on slaughter. Two diagnosed as positive showed no lesions. Fifty-nine considered as non-reactors proved negative on autopsy. Seven classed as negative reactions showed lesions.

2. The determination of a reaction calls for careful discriminating judgment on the part of the operator.

3. With regard to the seven cases of tuberculosis which we failed to recognize by the test, we prefer to attribute these to our own inexperience rather than to a failure of the test.

4. It is the only test so far known that is applicable to range cattle, on the range.

5. In comparing the subcutaneous and intradermal tests we find a remarkably close agreement in results.

6. It requires no modification of the ordinary routine of the animals, except that in range cattle it is necessary to confine them while making the injection and again forty-eight hours later, to make the diagnosis. The time of this confinement is insignificant.

7. The intradermal test applied five days after the subcutaneous test is not reliable.

ON September 22d Dr. C. A. Cary, State Veterinarian of Alabama, had the misfortune to fall from the roof of a new house that he is having constructed next door to his residence, and sustained three fractures; one at the left ankle, one in the left femur, and another in the left radius. Besides these major injuries, the doctor received minor injuries at different places about the body, and consequently has endured much suffering, more than anyone can possibly conceive, but his many friends in the profession throughout the entire country will be relieved to know that he is progressing nicely, that his present condition indicates a complete recovery, and that in the course of a few weeks he will be out attending to his many and important duties.

AN ADDRESS ON THE PRESENT STATUS OF ANIMAL SURGERY IN AMERICA.*

By L. A. MERILLAT, PROFESSOR OF SURGERY IN THE CHICAGO VETERINARY COLLEGE.

Having taken more than a nominal interest in the practice of surgery for some years, it naturally affords me great pleasure and satisfaction to be accorded the privilege of delivering the opening address before the first surgery session ever held by the American Veterinary Medical Association. This innovation is gratifying to me, as it should be to every enthusiastic veterinary practitioner, because it must be interpreted as an indorsement of the work of American veterinary surgeons and also as an indication that we are soon to have a separate surgery section—a section that will highly dignify the other departments into which this association seems destined to be divided, a section that will henceforth enrich the field of surgical knowledge from year to year for the benefit of our countrymen and which will serve in the future as the barometer of the progress of veterinary surgery in America.

Having, however, never deceived myself I shall not attempt to deceive you with any glowing accounts of our achievements, knowing full well that veterinarians have much less to be proud of as surgeons than they have as workers in some of the other departments of the profession; as a casual glance into our status shows that we are not without fault, that we have continued year after year to disobey the commonest laws which govern scientific surgical manipulations, that we have not succeeded in utilizing the whole fund of available knowledge, that we have not expanded the sphere of our usefulness to meet the highest expectations, the highest surgical ideals, and that we have not at-

* Delivered before the forty-seventh annual meeting of the A. V. M. A. at San Francisco, Cal., September, 1910.

tracted the greatest minds of the profession into the surgical ranks.

But we can in a measure at least condone our deficiencies in these several connections in a number of somewhat unfortunate limitations over which there is no adequate control.

It is well known that the surgeon who has animals for his patients has a pretty rough and rugged road to travel. He is hindered already in his pre-operative deliberations by the exceedingly difficult problem of diagnosis; he is handicapped in his operative work by the brute strength, the unintelligence and natural uncleanliness of his patients, and he is finally hampered in his post-operative management by their lack of any instinct of self-care or self-protection. And if we add to these obstacles, formidable as they are, formidable as only the experienced surgeon of animals knows, the great magnitude of a major surgical operation scientifically performed upon a large brute, we find some excuse for our contracted domain; we find therein the reasons why we veterinary surgeons are not to-day as freely invading the internal cavities of the body, for example, as the surgeons of human beings.

The low mentality of our patients, the difficulties of operative restraint and of post-operative control, the hazards of anaesthesia, the great cost of sustenance during long periods of convalescence, the filthiness of our patients' bodies and especially of their environments, judged from the standpoint of asepsis, are and I fear always will be discouragingly detrimental to our progress; and while other of you are engaged in solving great problems by which the whole live stock holdings of individuals, of whole communities, of whole states or even of whole nations are protected against plagues and scourges that may threaten to demoralize the whole live stock industry, and often the health and the welfare of the human inhabitants, we surgeons must be content with the humble mission of ameliorating or saving the life of the individual animal whose value is usually too small to create a demand for real scientific surgical work. We seem to have arrived at that point of our progress where we must either deny our patients the

benefits of scientific surgery or else charge up the expense to our sentimental or philanthropic inclinations.

So harmful are these influences against the enlargement of the scope of animal surgery that there is as yet no demand for the specialist from whom an elaboration of our knowledge should come.

On the contrary every practitioner must be more or less of a surgeon himself in order to meet the demands of his daily work; and since his mind is occupied in so many different directions he finds little time to enrich the fund of surgical knowledge by fruitful investigations and research. He finds little opportunity to acquire that knowledge of detail, that degree of skill, that practical experience upon which a successful surgical career actually depends. And unlike the human physician he is denied the opportunity of consultations with the convenient specialist who by reason of a broad experience is capable of performing complicated and intricate operations against disease which the general practitioner can not hope even to diagnose, to prognosticate or meddle with because such specialists do not exist in the veterinary profession.

True, there are a few men amongst us who stand out rather conspicuously as surgeons and there are a few teachers in the various veterinary colleges who, of course, profess to be endowed with a superior variety of surgical skill, but still we can not truthfully say that our ranks are very richly embellished with real surgeons. Although we point proudly to such men as Lautard, now of Paris; Adams and Harger, of Philadelphia, Williams and Udall, of Ithaca; Moore and Anderson, of Kansas City; White, of Nashville; Blattenberg, of Lima; C. A. White, of Chicago; French, of Washington, and other contemporary workers for our advancement, it is plain that these men do not occupy the same relations in the veterinary profession as such men as Mayo, Keen, Morgan, Fowler and others occupied in the profession of human medicine.

In truth the scope of veterinary knowledge has become so broad that the practitioner is actually swamped in the burden he

must carry. As a recent writer has said of the medical student, "He is like a man dragging along an already heavy chain to which new links are frequently being added"; soon he must stop, hopelessly incapable of dragging it farther. So with the veterinarian; he is now burdened with the many links of our science that he can not much longer successfully bear them all. If we were to follow a busy practitioner through a single day we might often find him pitting his knowledge against a number of highly diversified situations. A mysterious epidemic of swine, an uncommon bovine scourge, an unusual equine plague, a dying flock of fowl, a lame horse, a sick dog, a job of dentistry, a case of dystokia may all be encountered in a single day's activities. And if at the end of such a day's labor he attempts to perform a difficult surgical operation, would you not condone his deficiencies?

Here is where we fail as surgeons. Whatever may be our attainments in the science of surgery, we are through lack of experience, through lack of manual training, palpably deficient in the art. To retain the detailed knowledge of comparative anatomy, comparative physiology and pathology, the good surgeon of animals must possess and then to acquire sufficient mechanical facility to put these into successful operation in a number of different species of animals with their different habits and susceptibilities, is in itself sufficient accomplishment for the life of any one man.

And on account of these harmful conditions, an analysis of the position we occupy as surgeons among scientific men brings us face to face with a number of faults, a number of failings, a number of delinquencies that are not pleasing to relate, and if my subsequent remarks seem harsh, if they seem to condemn more than they commend, I trust you will not misconstrue the intent. It is my object to relate conditions as I see them without fear or favor.

Let us first see what has been and what is today our attitude toward the use of anæsthetics. Anæsthesia was discovered in 1846, sixty-four years ago, by W. T. G. Morton, of Boston, a man whose name will live in the ages as one of the greatest benefactors of the human race, if not also of the whole animal king-

dom, and since he received but feeble recognition for his wonderful discovery while he lived, it is but scant justice to pay tribute to his memory whenever the opportunity presents itself. Every man knows the horrors of surgery in the dark days before Morton. A no less celebrated writer than the eminent Scotch surgeon, John Hunter, once described a surgical operation as "A confession of failure that should be used only as a last resort," and I think it was the eminent pathologist Billroth, who, in his blunt German manner, said "A surgical operation is hell for the patient and purgatory for the operator." It is well known that the great and humane surgeons of the pre-anæsthesia era actually shunned and dreaded surgical operations on account of the almost unbearable shrieks and sufferings of their wretched patients. It remained for Morton in the most unexpected manner imaginable to devolve the means by which the most baneful effect of surgery was banished from the operating room forever.

To what extents have the veterinarians availed themselves of this great victory over surgical pain? It is no great credit to the older veterinarians that our history is so replete with evidence of their lethargy toward a more general adoption of anæsthesia. They practiced anæsthesia only as a matter of convenience to occasionally enable them to perform difficult operations, but seldom in the spirit of compassion for their mute, unwilling patients. It remained for the younger generation of veterinarians to bring about a pronounced change of attitude in this regard, but I must shamefully confess that there is still much room for improvement. In the large colleges and in the larger hospitals, the spirit of compassion seems to prevail, but in the general practice there are still too many torturing operations performed without due and sufficient regard for the sufferings we inflict. While we are, of course, justified in inventing ingenious methods of applying direct physical restraint to our patients, we should never allow these to be used as devices of torture, but we should instead remember that anæsthesia is not only the most divine, but it is also the most effectual of all restraints. Without attempting to preach a sermon I beg to suggest that every veterinarian who practices surgery

would heed the fifth passage of the Sermon on the Mount, which says "Blessed are the merciful for they shall receive mercy." Hypocrates fell into the spirit of things when in his earliest writings he said, "To relieve pain is divine"; a motto that has served as the basis of medical ethics for twenty-five centuries. And to this the veterinarian should add, "To inflict preventable pain is inhumane."

The fault has been in our veterinary colleges, where too little attention has been paid to the teaching of practical surgery. The veterinary students of past decades were not taught the use of anæsthetics, but in America since our Department of Agriculture, through its Bureau of Animal Industry, has so thoroughly dictated the surgical curriculum, more attention is now paid to this along with other practical subjects, and the effect is already apparent in the recruits of the past two years.

I was never so proud in my life for being a teacher of animal surgery as the other day when called to the country by a recent graduate to perform an operation upon a large stallion. While I was engaged in assembling and sterilizing the instruments, he cast, secured and anæsthetized the two-thousand pound brute without consulting me as to whether or not that was my plan of procedure. This simple event showed clearly that his conception of a surgical operation includes the administration of an anæsthetic. I thought to myself, what a blessing if every veterinary surgeon in the world could at once be transformed into such a humane, yes, such a good surgeon, as this young practitioner of a few months.

It would be a sin of omission if I neglected to mention the influence this association has been in this regard. Many of you will remember the first clinics of the American Veterinary Medical Association were little more than exhibitions of brutality, but now all the animals operated upon for the edification of its members are handled with more mercy. For this transformation we are indebted largely to the late and lamented Roscoe R. Bell.

Next let us see what we are doing to-day with the teachings of Lister. It is now more than thirty years since Lister, Pasteur

and others announced to the world the greatest scientific discovery of modern times, the discovery that wound diseases are caused by a preventable, external contamination. The theory, for it was then but a theory, was soon heralded throughout the whole civilized world, and it was so rapidly proven to be correct that within a few short years the standard surgical therapeutic and surgical technique of centuries was entirely revolutionized. Operations known to be fatal in every case were made harmless, and the miserable complication of wounds then supposed to be inevitable were universally suppressed. The discovery when put into operation for the first time by surgeons proved too good to be true—the fondest dream of years had at once become a reality. In the words of Prof. Keen, “Daring has become conservatism; rashness has become common sense.” Who could predict the effect of this wonderful discovery upon the progress of surgery; what man can reckon the immeasurable saving of life, the incomputable relief of suffering and the opening of new surgical fields, the cranial cavity, the thorax, the abdomen, the intestines, the joints, the eye, the ear, regions and organs which were formerly sacred only to the action of disease and which were inspected only at the post mortem may now be opened freely to the renovating measures of the surgeon and to the full gaze of the student. Eloquent volumes have been written to celebrate these themes; my feeble remarks can but trace its eulogy.”

But let us stop and ask, “Has the veterinarian fully appreciated the significance of this great discovery by having put it into practical operation?” Shamefully I am compelled to confess that we have not, except in a humdrum sort of fashion, but certainly never to the fullest possible extent, although we are apparently at the threshold of a new epoch in this connection. For twenty years the veterinary profession entirely ignored asepsis although its merit and worthiness should have been appreciated from the very beginning. And from this unsatisfactory state of affairs we have passed into an epoch that I shall style the epoch of fake-antiseptics. It is the epoch in which we are to-day living and which I so sincerely hope is rapidly drawing to a close. I use the

phrase "fake antisepsis" advisedly and because we are to-day knowingly guilty of practicing faulty methods. Sometimes we fake because we imagine that the practice of asepsis is a useless, a hopeless and an impossible undertaking, and thus we continue year after year to leave our patients to the mercies of preventable complications; but still worse it is very evident that we often fake to mimic the real aseptic procedure if not also to deceive our spectators that we are modern in our work; and how often are we privileged to witness the real scientific operation that will stand the scrutiny of the knowing eye? Very seldom. Why, gentlemen, would it not shock your sensibilities to learn that there are veterinary colleges to-day graduating hundreds whose surgical departments, not content with scoffing, winking at and entirely ignoring asepsis, are actually not provided with any means of sterilizing surgical appurtenances and instruments?

While these facts reflect seriously to our discredit the sooner they are proclaimed the sooner we will mend our ways.

In the spirit of charity I shall admit that the wheels of progress are bound to be slow, because the practice of asepsis in animal surgery is not always a simple performance, often requiring more or less elaborate accommodations and special equipments that are not always at the disposal of the veterinarian when called to operate; but it is indeed remarkable what can be done in this regard if an assiduous effort were made in every case to create that great "germ-free oasis" that has developed from the teachings of Lister and without which the real surgeon refuses even to inflict a wound.

And let me admonish you that if we solicit scientific consecration as surgeons, we must first lay down a foundation for our work upon which is written in the boldest relief that great surgical word "asepsis."

We seem to have progressed as far as possible with our old semi-scientific surgery and now if we entertain an earnest desire to broaden our field of endeavor, to strengthen the prestige of our craft, to earn a position among learned specialists, we must now begin to display a more wholesome respect for the niceties of

asepsis. Some of you may claim here that a fair measure of success can be obtained in veterinary surgery without asepsis, which is true and which I grant freely; but the explanation is found in the ridiculous simplicity of the operations we have thus far dared to perform. If we wish to march onward to more glorious achievements than it has yet been our privilege to enjoy, we must broaden the category of our surgical operation by the addition of those procedures which we would dare to perform under strict asepsis.

And now just a word about haemostasis. Every surgical operation is of course more or less sanguinary, but we seem to have paid too little attention to the systematic management of bleeding and haemorrhage. We have been prone to wade through long bloody dissections, leaving the matter of haemostasis for the last step and then effecting a control of the bleeding by the crude method of compression, either by hurriedly wrapping up the whole region with a taut bandage or else rapidly packing the traumatic cavity with a wadding to be retained with suture, methods which are both unscientific and harmful, methods which can no longer be countenanced in the light of modern surgery. To complete an extensive dissection with the loss of but a handful of blood is an art we do not seem to have acquired; although it is an art, let me assure you, that will play no small part in the destiny of our surgery.

The surgical wound held free from blood by modern methods of haemostasis, held free of microbial contamination by modern methods of asepsis and inflicted without pain by modern anaesthesia is our only path to that high level now occupied by the art of human surgery. Failing in this we are destined to plod along in the same painful state of mediocrity.

Aside, however, from this pessimistic view of our status, there is the optimistic side that I might have taken for my theme, but which I now have no time to analyze. It is farthest from my mind to assert or even to intimate that we have made no progress. We have only to look at the paltry consideration that surgery received at the hands of this association during the earlier

days of its history, to scan the pages of the annual reports for the desultory essays presented on surgical subjects during the later years, to note the institution of an almost shameful clinic at Omaha in 1898, and then compare these with the work on surgery during the last few years, and you can obtain better than I could otherwise describe, a splendid perspective of the progress of animal surgery in America, if we admit as we all do that the annals of this great association furnish a fairly complete history of the progress of veterinary medicine in this country.

DR. J. M. PARKS, who has stepped from the chair of secretary to that of president of the CHICAGO VETERINARY SOCIETY, after three years in its service in the former capacity, reports that organization in a good healthy condition, with membership steadily increasing; the names of nearly fifty members in good standing now being enrolled. In concluding his letter, the doctor expresses his appreciation of the AMERICAN VETERINARY REVIEW, during his connection with the society as its secretary for the past three years, in the help that it has been to him. In reply the REVIEW wishes the society continued prosperity and a profitable winter's work; the season when most local organizations do their best work. This organization meets the second Tuesday of each month, and should be well attended in a city like Chicago. The other officers are: E. L. Turtman, Vice-President; D. M. Campbell, Secretary, and C. A. White, Treasurer.

THE LITTLE SHETLAND Cow. The little Shetland Cow, like the Pony, is an excellent representative of the native breed. If fed for the fat market she would "kill" about 3 cwt. dead weight of beef. If used in the dairy she would yield about two-thirds of the quantity of milk produced by the average Short-horn. But these Shetland cattle have one qualification to which few of the breeds reared on the mainland of Great Britain can lay claim. Tubercular disease is almost quite unknown among the island cattle. They have to rough it in these wind-swept islands of the North Sea on the borders of the Arctic Ocean, and they offer a practical testimonial to the value and efficacy of the open-air treatment for tubercular patients.—*The Live Stock Journal.*

A NATION'S LOSS—A PROFESSION'S TRIBUTE TO FALLEN LEADERS.*

By W. HORACE HOSKINS, PHILADELPHIA, PA.

In the march of progress of this Association and under the impetus of its large and growing membership, there drops from our number from time to time members who have specially laid us under great obligations. Others who have left some strong impress upon the profession's advancement. Of those of whom I shall speak in the short time accorded me by our secretary, are all men who have passed away and of whom I have had the pleasure of close personal friendship and an intimate knowledge of their worth and work.

RUSH SHIPPEN HUIDEKOPER.

Physician, surgeon, veterinarian, horseman, sportsman, soldier, citizen, author, writer, clubman, professor, journalist, society man, gentleman, last, but not least, friend of friends.

Though less than fifty years measured his birth and life work, he crowded it to overflowing with strenuous efforts to serve his country, his state, his profession, and laid at our entire people's feet a debt of lesser or greater magnitude whether they lived in palaces or in the humblest hovel in the land.

A prince of good fellows, lifting all that he touched to a higher plane, whether in the field of sport or the vineyard of labor. A public servant of the highest order whether in the role of physician and surgeon, in the dispensary or in the lanes and alleys of a great city, or in the field of military power and powers aiding the afflicted and suffering or in the military camp as a sanitarian, conserving the health and strength of a nation's young

* Presented to the 47th annual meeting of the A. V. M. A. at San Francisco, Cal., Sept., 1910

blood that had chosen the field of soldier to serve their country and state.

As a teacher and instructor he was as faithful to the students' needs and demands, as loyal to their interests as he was prodigal in robbing his great physical powers of rest and strength. I have known him to fill the role of professor and teacher for three consecutive days and for three nights of the same days, fill the role of nurse and friend at the bedside of one who was near and dear to him, without sleep or rest, except what was gained by an hour's ride on the train; he filled this place with only the thought of duty well performed.

As generous and unselfish in every sphere of life he filled, accompanied as it was, with the charm of modesty and the utmost pleasure of freely giving; he learned and lived how much more blessed it was to give than to receive. His generous, unselfish nature was as highly exemplified as the consultant at the bedside of a patient and as boundless there as at the sumptuous table of peace and plenty, that he loved to provide for those to whom he was attached by bonds of friendship, social or professional relations.

He hated hypocrisy as bitterly as he despised meanness. He had no quarter for the traitor in high or low place. He pitied the former while the latter was the only condition or acts of man that he was ever known to display anger or temper.

Born under the parental roof of luxury and of parentage that carried with it the blood lines of the first families of the land; schooled under private tutorage and select schools; educated in the University of Pennsylvania Medical Department, trained under the tutorage of that great surgeon Agnew; a period of post-graduate work in foreign schools under special privileges, made for his requirement a kind of training that many, many times spoils most men for serious and successful work. With all these aristocratic surroundings his demeanor was of the most modest character, his friendship strong and loyal, his respect for others' opinions and views the most considerate and thoughtful. His gentlemanly demeanor at all times and under all circum-

stances won for him a warm place in the hearts of all whose privilege it was to know him intimately. While serious at most times in demeanor, he could enjoy a joke with all the zest and humor of any man. I recall one morning meeting him as he emerged from his home in the "City of Brotherly Love," having the night before spent a convivial evening with one of his army friends, whom he invited to his home to spend the night. An early morning call to a suburban client compelled him to leave before his friend had arisen, and on his return he proceeded to his room and found his friend seated on the bed, with the most curious night robe hanging in a dozen or more streamers from the neck band to the lower border, and his friend commending the fine traits of character of a beautiful black, French poodle, which Dr. Huidekoper was very proud of. This dog, to show his appreciation of his guest, continued for some thirty minutes to jump up and grasp his friend's night robe and slit it from neck to circumference in a dozen streamers. As he told the story he shook with laughter until his whole frame was convulsed with the ludicrous picture. Dr. Huidekoper was a man of magnificent physical proportions and as heroic in action as he was in strength and physique. The call of duty ever found him ready to respond. With soldierly training he ever seemed to sleep on his arms. When there swept through the land the terrible story of Johnstown's catastrophe, the call of duty found him a few hours later at the post of service, rendering to the living every possible aid that could be given, protecting the dead from the hands of vandals and vultures in human form, bringing order out of chaos, day after day with only a little snatch of sleep now and again. His military training, his knowledge of medicine, his skill as a surgeon, his kindness of heart, and splendid courage made his services of special worth in such an emergency, and won for him the highest commendations of the people of the Keystone State.

Among his greatest treasures in life and with whom he had formed the greatest companionship, was his famous flea bitten mare "Pandora." Pandora was one of the greatest hunters in Pennsylvania. Her steeplechase achievements were heralded far

and wide. Her famous leaps over the bars and gates of the toll-roads for ten miles out of Baltimore was as equally known as her victory in reaching first a point on the opposite side of a valley, through which flowed a deep and wide stream, while those who raced along the side of one hill to reach the bridge some miles beyond there to cross and retrace their steps on the opposite side of the valley. Apparently outdistancing Pandora, his rivals were already exulting over his defeat. He on the back of Pandora rode down the valley's slope, leaped fence and rail again and again, and then forded the stream, much of which the mare had to swim with her master on her back, and up the other slope he awaited the oncoming of his rivals, who sometime later reached him with jaded steeds, and themselves almost worn out with their own efforts in their struggle to defeat him.

Almost as famous in death as she had been in life, there will ever remain the oft-told story of how he entertained his friends at a sumptuous feast at the famous Philadelphia Club. It was known as the Pandora dinner, and given in her honor to many of those who had rejoiced with him at her many triumphs. After the dinner had been served, and the cigars and coffee reached, he told his guests of the several courses in the feast, where the tenderloin and giblets of Pandora's flesh had been so skillfully and tastefully prepared. It was always a source of regret on his part that a flash light picture could not have been taken of the faces of his guests when they realized that they had dined on horse meat. To this day there are men in that city who can not even yet think of that occasion without some misgiving as to the position of their stomach.

LEONARD PEARSON.

Devoted student, successful graduate, skilled practitioner, able instructor, patient investigator, eminent public official, true diplomat, profound teacher, sincere friend, strenuously consecrating his life to the broader development of veterinary science. Thrice

blessed indeed is the field of any work for such a man. Stricken indeed, injured beyond the hope of repair, must be the cause, in the loss of such a helper. Timely is the occasion to pay tribute to such a fallen leader. He was not a man without honor in his own country, for he was as deeply loved and admired by those who were closely associated with him in service, as he was honored and appreciated by those at home and abroad who were permitted from time to time to realize and measure the progress of his work, and gaze upon the magnificent plans he unfolded to the world as the triumphant march of veterinary progress. Simplicity and gentleness were as much a part of his daily life among men as were the earnest work, untiring energy, and deep devotion to every aspect of the field of veterinary science, to which he added the touch of progress, advancement and achievements that seemed to be boundless in their limits. His childhood days were idealistic, spent in great part in the loving companionship and tutoring of his saintly mother, for whom he maintained until his untimely death the most profound devotion, tenderest solicitude and loving attentions and in his own life was reflected the gentleness and simplicity that so markedly characterized his attitude toward all with whom he daily came in close communication. His work as an instructor will never die, for men will ever emulate his rich and exemplary life. His fortitude and forbearance will ever be remembered and its softening and benign influences will continue to spread their soothing unction over the body of men who honor and revere his name. As an investigator and his splendid contributions to the field of original research, will ever be a beacon light to the true investigator and a stimulus to the genius of others, for he ever loved to share the glory and renown of his achievements with those who in some part contributed to their successful attainment. As a true diplomat he had accomplished in his adopted state a work in the field of veterinary sanitary control, excelled by no sister state of our union and scarcely equaled by any others. Legislative bodies would come and go, state officials would fulfill their terms of office and others would succeed them, with them all in their turn he won them to his

cause and each successive change was marked by greater advancement, broader lines of work and stronger pecuniary support to the work he advocated and opened up for the welfare of the people of the Commonwealth of Pennsylvania, and established a system that has been many, many times deservedly honored by the name of the Pennsylvania system. Untiring and ceaseless were his labors for our common calling. The goal he sought seemed ever to be just beyond and like the *ignis fatuus* he bent every energy that he might hasten its accomplishment. Strong and brilliant in mind, powerful and resourceful in his physical strength, bearing the burdens of many, sharing the labors of all with whom he worked and labored, he tried all these powers to the breaking point, and in the seeming hour of his greatest strength, with a more restful period on the viewpoint beyond, he paid the penalty of an overtaxed mind and body and his own state, our country, a nation's profession witnessed the fall of the ablest and greatest leader of his day and generation that our profession has known. As an investigator we owe him a lasting debt of gratitude. We owe him much for the splendid methods he inaugurated. A state farm, where under ordinary farm conditions, the many unsolved problems of our long list of contagious and infectious diseases might be more successfully studied, was one of the earliest of his plans. To Pennsylvania he rendered services of untold value, and when successfully applied there, he modestly, without any ostentatious display, gave the results of his work to the entire world. He gave the name of forage poisoning to one of our most disastrous diseases by proving that it belonged in that category for its development, and brushed away the mystery of that disease as well as the confusion engendered by the names of cerebro-spinal-meningitis, spinal-meningitis, spotted fever, putrid sore throat, etc. A successful practical method of vaccinating cattle, whereby immunity might be given to the greatest and most destructive enemy of our dairies—tuberculosis—made its richest and best progress under his directing mind, while methods for its better control without disturbing the equanimity of a people, found successful fruition at his hands.

ROSCOE R. BELL.

Printer, reporter, journalist, student, teacher, professor, eminent practitioner, editor and association builder and supporter.

With all the limitless energy and determination combined with the enthusiasm of early years, our esteemed colleague planned well to fill an important role in the history and development of veterinary science and died in the harness at the period of life that in most men dates the years of their greatest strength and power.

His early life filled with vicissitudes above which he rose by the assertion of manly powers and virtues that fashioned his later life and placed him among the busiest of men and led him to break every law of nature in its inexorable demands for physical rest.

The role of printer and reporter, in early life, well equipped him for the field of journalism that he served so faithfully and zealously in later life.

It early fitted him for the period of studentship in veterinary science to which he attached himself at a time when most men are through with their college career.

The charm of medicine and the allurements of the clinical field of general practice; his love of medicine and his fondness for the mysteries and achievements of therapeutics soon carved out for him one of the largest private practices ever enjoyed by any practitioner in the large cities of our land.

The generous reception given him by his large and wealthy clientage of the "City of Churches" did not win him from a recognized duty he felt he owed his profession and even in the hour of increasing and more exacting demands of his private practice, he gave to the student body of the American Veterinary College a splendid and most profitable course of instruction in *Materia Medica* and *Therapeutics*. Back to his first love, ever the tendency of human nature, he found in the journalistic field of the *AMERICAN VETERINARY REVIEW*, a place of service to which he gave of his time and strength more than a generous

part. These many demands for a larger and larger share of his time for the common good were too often given out of this period of physical rest his many duties sued for, and the warnings of an overtaxed system he failed to acknowledge, that the richest fruits of his fertile mind and his increasing love for his profession might long be enjoyed in richer power and truer wealth.

In the evening of his career that should have been the mid-day of his services, with waning strength he gave himself unwittingly to higher and better association work, in his state and the city Greater New York, which found its ultimate climax in filling befittingly indeed the highest office in the gift of this association with distinguished honor and ability.

PROFESSOR ANDREW SMITH.

Eminent practitioner, popular teacher, thorough horseman, good citizen, pioneer in veterinary education in Canada.

The death of Andrew Smith removes one of the best known men in our profession in North America.

He had reached the more than three score and ten, of which a half century was given to teaching, and in every part of North America may be found representatives of the school over which he presided for nearly fifty years.

A graduate of the Royal College of Veterinary Surgeons from which body later in life he received additional honors in recognition of his services in the Canadas.

Loved and respected by the student bodies of continuous years, admired by them for his loyalty as a teacher and the solicitous consideration he ever had for their welfare.

The field of the horseman in its broadest and truest sense was one in which he displayed the highest activity, and he looked with the eye of a connoisseur upon their feats of strength and speed with much zest and appreciation.

Filled with the highest civic pride, he filled the role of citizenship in every capacity that added to the welfare, growth and prosperity of his city and country.

All in all, he was a true gentleman, genial in manner, kindly in spirit and knew full well how surely, "The soft answer turneth away wrath."

SIMON J. J. HARGER.

Earnest student, successful graduate, capable instructor, true surgeon, valuable contributor, translator and earnest professor.

I well remember his entrance to the Veterinary Department of the University of Pennsylvania as a student. His modest demeanor, his retiring and reticent disposition were as marked as a student as they were characteristic of his entire life as a practitioner, teacher, surgeon or writer. He sought no vain glory in any place or position. Conscientious, and his own most severe critic, as a teacher and surgeon he filled both these places in a true light. His role was not that of a popular practitioner or surgeon, for the truly scientific aspects always controlled him.

As deeply as was his life work appreciated by the student body for his loyalty and devotion to their needs and his patience with those who find anatomy a difficult subject, the practitioner will long honor his memory for the true word pictures he gave and the uncolored reports he rendered to his colleagues of whatever his pen turned to recount in his own field of surgical experience or investigation.

His work as a clinical instructor was of the richest character and as free from exploitation and deceit as ever characterized the life work of any of our teachers.

A great student, a patient worker, a prodigious reader, made him ever zealous to convey no unsound views or knowledge to the formative period of the student's mind or dangerous field of activity for his colleagues to enter that would endanger a clientele or injure a reputation.

Less than forty-five years of age, he leaves a place in the field of teacher hard to fill; as a writer, a fitting example for all to emulate.

At his death I well recall the words of one of his colleagues when he said that at all times, in all places, and under all circumstances he was ever the true gentleman.

Pennsylvania feels keenly indeed that she has been twice sorely stricken within the past year. Men of the types of Pearson and Harger are many times a state's contribution of many years' growth. And lest we not forget, let us enshrine their memories in the safe keeping of a sorely stricken profession.

THE following from Dr. Harry Norris, Felicity, O.: "Enclosed find post office money order for \$3.00, for which please extend my subscription for REVIEW to January, 1911. The information is well worth the money."

THE NATIONAL HORSE SHOW, to be held in New York November 12 to 19, promises to be even a greater success than that of last year, which is remembered with great satisfaction by all whose privilege it was to have attended it. It is really assuming an international character, as competition is expected between French cavalry officers and those of England, Holland, Canada and the United States. More entries have been received up to the time we go to press than had been received at the same date last year, and it is thought by the management that last year's entry list of 1,500 will be exceeded.

WE are indebted to Dr. A. T. Ferguson, of Evansville, Ind., for the following clipping from a western paper which we are not able to credit with it, as the name of the paper was not given: "POPLAR BLUFF, Mo., June 28.—A mare, thirty-five years old, aroused its owner, Martin J. Bock, and by its strange actions led him to a pasture at three o'clock Sunday morning. He discovered that the animal had foaled a colt which was an hour or two old. It has been twenty years since this mare foaled before, and probably she is the oldest equine mother in Missouri, if not in the United States." Unusual as it is for a mare to have a colt after a lapse of twenty years since the last one, we knew of a mare that had her *first* colt at thirty-seven years of age and had two others in succeeding years, dropping dead suddenly while grazing soon after the birth of the last one.—[EDITOR.]

MONOLITHS OF COMPARATIVE MEDICINE.*

By W. H. LYNCH, D.V.S., PORTLAND, ME.

In selecting a subject upon which to prepare a paper it seems to be customary to show cause why we have decided upon a particular one; and I will say I can show no better cause than that the field of comparative medicine has been well threshed in previous meetings by papers containing reports of cases, outcome of research and the varied phases of our profession described by different members of this association. So finding a subject upon which to write has been no small source of worry to me. It is not easy to find a subject of equal interest to all, but I have chosen the above, for, in the substratum of our mental collection of facts, we all have a collection of monoliths which from time to time have done and continue still to do good service. It is in the hope of extending these limitations, to know there are broader fields, greater breadth, that is knowledge. It is a high privilege to teach, but a higher one to help men teach themselves.

Glancing back a decade or two it is apparent to us all what vast strides Comparative Medicine has made. "Never yet hath anyone attained to such perfection, but that time and place and use have brought addition to his knowledge, or made correction, or admonished him that he was ignorant of much which he had thought he knew."

In the light of latter-day attainments, we smile at our forefathers' tenets, but we in our turn will be held up to derision by those who come after us in this field. The old practitioner acted up to his lights, and all we can do is the same. Yet if we are sufficiently impressed with the fact that we know so little to-day,

* Presented at the mid-summer meeting of the Maine Vet. Med. Ass'n.

with the vast field lying before us for discovery and advancement, we are bound to consider how little we do really know. This makes us discontented and we must perforce strive to gain more knowledge of diagnosis, therapeutics and prophylactics.

Let us consider our methods of diagnosis. The detection of latent disease in an animal by the injection of the products of the causal organism has been used for some time. In tuberculosis and glanders the subcutaneous inoculation of tuberculin or mallein produces certain effects—such as a rise of temperature in a diseased animal and has no effect on a healthy one. These methods are comparatively old; much more recent is the method known as sero-diagnosis.

This method identifies disease by the fact that the serum of the affected animal possesses certain properties not possessed by the healthy animal. The most important discovery regarding diagnosis is the serum agglutination test. By agglutination we mean clumping together masses of bacilli in a medium on the addition of a certain serum. The serum of healthy horses agglutinates bacilli slowly at dilutions below one in three hundred; while the serum of glandered horses is very active in dilutions below one in a thousand, and the phenomenon is demonstrated in solutions as weak as one in sixteen hundred.

Our medical brethren have applied sero-diagnosis in the agglutinative test for typhoid fever, by which means it has been possible to differentiate cases of paratyphoid fever from typhoid, and the occurrence of the former as a distinct disease explains a proportion of the failures of the serum from supposed typhoid patients to clump typhoid bacilli.

This clumping or coagulation of bacilli on the addition of serum is brought about by certain substances called antibodies by Welch who writes of the antagonism of the healthy organism to all sorts of foreign cells, cellular products and derivatives. These substances, either albuminous or like albumin, are produced in the living organism when certain substances are injected capable of producing the necessary reaction, and their mode of antagonism consists in neutralization of poisons and ferments, cessation

of motility of cells or their appendages, destruction or injury of cells, agglutination of cells, precipitation and coagulation. We, therefore, class these bodies by their manifestations into antitoxins, antienzymes, cytotoxins, agglutinins, precipitins and coagulins. All these bodies are in a high degree specific to the nature and source upon which they exert their characteristic effects. At least, they are usually highly specific.

Just recently these specific antibodies have been divided into two groups; in one of which, represented by the antitoxins, the antagonist is a single body; in the other the cytotoxins or cytolysins, the antagonism is due to the two bodies co-operating.

The cytotoxins or cytolysins include among other things the bacteriolysins and the haemolysins. Of the two bodies which comprise a cytolysin, the one which actually destroys the cells is found in the organism, but requires co-operation of another body produced during the process of immunization. Many names have been given to these cytolitic components. The one which is the specific product of immunization is called the intermediary body, immune body, ambocepter; and the other one the complement.

Diagnosis by means of serum has not become practical for everyday work, and possibly promises much for the future; will, no doubt, be a great success.

By logical steps we come now to therapeutics. We have found good results from treating bacterial diseases by the use of the antitoxins of the bacterium, or by the serum from an immune animal. We give quinine to our patients in cases of malarial parasites. Quinine being possessed of specific action in the human subject, but in our cases, while slightly useful perhaps, is certainly not specific. When I was in South Africa I saw horses affected with what was locally known as billary fever, but which from a careful consideration might better be called equine malaria. I have seen a few western horses in New England showing characteristic signs of malaria. Now this ailment is not caused by the parasite of the genus plasmodium causing malaria in man, but the genus pyroplasma, which is closely related to the pyroplasma bigeminum and pyrolasma canis, the

former being the parasite which causes the disease known as Texas fever; and the latter causing the malignant jaundice of dogs—a disease often seen in South Africa, but seldom seen here.

Here is a triad of diseases caused by similar organisms; belonging to a type related to the one causing malaria in man, and while quinine acts specifically for man in the similar diseases it has only a slight effect. The remedy which we found effective in South Africa for equine malaria was ammonium chloride.

Quinine and ammonium chloride are two very dissimilar drugs. In the other diseases, Texas fever and malignant jaundice of the dog, no especial line of treatment seems to have been followed, many agents being used with indifferent success. The point of this is that up to now, we have nothing in the way of medicine upon which we can place any faith. Antitoxins cannot be procured from this class of malarial parasite, so that is another line of treatment closed.

Then we have left the method of combating the disease by destroying the intermediate bearers of the pyroplasmata. This is a tick—the boophilus bovis in the Texas fever; hence by destroying the ticks upon an affected animal, even if his blood has numerous parasites, the disease is prevented from spreading; and although our knowledge is limited upon several things in connection with this disease, I think it is only a question of time when we will be in possession of most of the facts of Texas fever and similar ills.

In stamping out Texas fever, the farmers tried for years—are still trying to destroy the ticks. Once the ticks were all destroyed it follows the disease would be unknown; but since there is still Texas fever, the ticks are presumably still living in numbers enough to cause trouble. Since then we are unable to stamp out this disease by killing the ticks, we must try another alternative. The alternative found most successful is the production of a mild attack of the disease, rendering the animal immune. The inoculation of the virulent blood which gives the disease must be in such a manner that it will not bring on a fatal attack, nor be too weak to protect. This was the problem they were trying to

solve in South Africa a few years ago when I was with the Remount Commission there.

I think we are on the eve of making great discoveries concerning the role played by ticks, arachnoids and insects in reference to these diseases.

In referring to the therapeutical action of antitoxins and sera as the object of scientific treatment, the question arises, what are these substances which act antagonistically towards either the bacteria themselves or their detrimental products, and whence do they come?

The bacterial immunizing subjects have their origin in the lymphatic glands, spleen and bone marrow, and they are complex molecules, not modified bacterial substances nor combinations of bacterial products with the albuminoids of the organism. They make up a part of the organism and help in the vital processes. Their appearance in the blood at the time of the immunization ought to be considered a specific excitation causing a specific secretion. They act chemically and physically like ferments, forming no part of the globulin or albumin of the blood. Their sort of ferment is demonstrated by bacteriolysis. The immunizing substances incorporated with the bacterial cells find themselves free and active at the end of the dissolution of the bacterial protoplasm, after the fashion of true ferments. The bacteriolytic action of the normal body fluids is not due to a single alexin, but a combined action of amoebocytes and complement. The term resistance applied to the phenomenon rests above all on a considerable afflux of the body fluids rich in amoebocytes towards the place of infection, caused by inflammation. The best known antitoxin in all probability is the antidiphtheritic serum used generally for human subjects, but which I have found to be of service in avian diphtheria or the common roup of fowls in stopping and controlling spread of this malady through a flock of common poultry; the organism causing this disease being found to be similar to the bacillus of diphtheria.

This antitoxin is prepared by injecting a horse with weakened cultures of the Klebs-Loeffler bacillus or suitable doses of diph-

theria toxin which causes a feverish reaction, which soon passes away, leaving the animal less susceptible to the bacilli; the serum of the horse being finally drawn off and preserved. Then this antitoxin has the power to make immune by being introduced into the organism previous to attacks of diphtheria, and is of great value in attacks.

For the classes of diseases with which we come into contact there is a large group of antitoxins which are used with more or less success by the veterinarians. We have antistreptococcic, anti-tetanic, antirinderpest, and antidistemper bacteriolytic sera.

When I speak of antitoxins I grow enthusiastic. I may be over sanguine, but I have had such good results from this class of agents that I have great faith. Both antitetanic and antistreptococcic sera have for me restored animals to health and usefulness that were practically moribund. The future of serotherapy looks bright with promise to me, and I think will prove epochal if not revolutionary in comparative medicine.

With all this it is perhaps better that we make animals immune to disease when it can be done by vaccines and prophylactics. I have been advising my clients who have me to do operations on young dogs to make them immune to distemper by vaccination, as it seems too bad after one has been to expense for them, to have them enfeebled as they often are after an attack of distemper with some of the distemper sequelæ, paraplegia, epilepsy, et cetera.

Distemper attacks young dogs and epizootic gastritis is found in old dogs, being two widely dissimilar diseases, yet are caused by the same organism, one of the pasteurella group; these discoveries greatly simplifying the former complexities. Going further it has been found that one organism was responsible for pink-eye and contagious pleuro-pneumonia. Of course there is always the hypothesis of mixed infection, but I have noticed the interchangeability of pink eye and contagious pneumonia.

We now know that the diplococcus of Schutz which causes pleuro-pneumonia is identical with the streptococcus of strangles. This illustrates what we may yet find to be true of many of the

diseases of our dumb friends. I believe we may congratulate ourselves on the amount of knowledge we have regarding their ailments, but keep a watchful eye on the unknown, that all of us do his part toward lessening the unknown till we conquer disease. None of us may see that time, but it is logically coming. Men are growing wiser and stronger on all lines year by year, hence they will come to know the scope of the work of the Doctor of Comparative Science, whose function should not redound simply to the economic advantage of the stock owner, but who aims to annihilate the diseases directly transmissible to man, thus protecting human life by destruction of parasitic and contagious organisms.

Much of the work of the veterinarian is to prevent disease; the physician relieves it in incipient and advanced stages. The position of the veterinarian as a safeguard of public health is not appreciated by the generality, but the time is coming when his great value will be recognized, and he regarded as an indispensable factor in every community, working in harmony with the physician to relieve suffering and save lives.

In the times to come the veterinary profession will be represented on every Board of Health in cities, towns and states. Every medical school that is worth while will have in its faculty Comparative Pathology and Comparative Medicine. Then will the position and the high plane and scope of his work be universally recognized.

N. B.—Attention is directed to the fact that all mail intended for the secretary's office of the A. V. M. A. should be addressed to Dr. C. J. Marshall, Secretary, Thirty-ninth street and Woodland avenue, Philadelphia, Pa.

WITH the compliments of Dr. Jas. B. Paige, we are recently in receipt of a pamphlet on *SPOROTHRIX AND EPIZOOTIC LYMPHANGITIS*, by Calvin Gates Page, M.D., and Langdon Frothingham, M.D.V., of the Bacteriological Laboratory, Harvard Medical School, Boston, and James B. Paige, B.S.C., D.V.S., Professor of Veterinary Science, Massachusetts Agricultural College, Amherst, Mass., illustrated by some excellent insert plates from the *Journal of Medical Research*.

AZOTURIA*

By D. W. COCHRAN, NEW YORK, N. Y.

Azoturia signifies an arrest of locomotion caused by paralysis of the limbs of either the anterior or posterior extremities, together with a morbid change in the character of the urine.

It is a well-recognized disease peculiar to the horse. It may exist in the mule. I have never seen a case in my experience.

It is a disease of the well-kept horse. It does not occur in poor, neglected horses. It is a disease of plethora. It comes on in young, vigorous animals, when growth and development are proceeding rapidly, occasionally or rarely in horses of advanced age.

It is called by some authors a blood disease. Some a nervous disease. I think it is primarily a blood disease for the physiological relations of the blood to the solid parts being so intimate, it is to be expected that pathological changes in the blood, would give corresponding morbid phenomena in the organs and tissues of the body.

Our knowledge of the susceptibility of the nervous system to morbid influences derived from an abnormal composition of the blood and especially of the "effects" of the toxic principles of the blood due to an accumulation of poisons in the system may be illustrated by the injection of some powerful nerve stimulant, as strychnine and aconite into the blood. The nervous system responds very promptly to their physiological toxic action.

The history of one case is about the same for all. We get a great many cases in cold weather. Almost in an epizootic form about the Christmas and New Year holidays. The working

Read before the twenty-first annual meeting of the N. Y. S. V. M. S., Ithaca, Aug., 1910.

horses have had a couple of days idleness. They have been fed, the same as though they were working steadily, very often less, but they get no exercise in the meantime. Here we have two factors—idleness and rich feed. The equilibrium between waste and repair is suspended, and plethora is established, at the expense of the various excretory channels, which seem to have become inactive through "engorgement."

This is a fact which we do not recognize, nor can we by any physical means, until the horse has been driven for about one hour or the distance of five or six miles. He starts from the stable in the best of health and condition, vigorous and robust.

After being driven for an hour or thereabouts, a change is noted. He begins to hang back, begins to perspire freely, a cloud of steam arising from his body. We have now a period of great excitement. He exhibits a hurried respiration. An anxious look, he suddenly becomes very lame in one hind leg. He stops altogether, he trembles all over, looks around at his side; acts as though he had colicky pains, his back becomes arched. Inability or loss of control of the muscles of the stifle. He begins to knuckle at the fetlock. Stands in this position for a few seconds and then falls to the pavement, he again arises on his forward legs, drags himself along on his flexed posterior knuckles and falls again prostrated. He will struggle violently. He becomes delirious and is uncontrollable. He often lays in the street in this condition for hours. He is all covered with mud and slush, often laying in piles of snow. The attendants exhausted trying to keep him under control; about this time an ambulance arrives only to add to the existing excitement, he is pulled and hauled and loaded on a platform and dragged in and out of the ambulance before he can be put under treatment. The period of excitement through which he just passed generally leaves him in such a state that treatment is hardly of any avail. The treatment which is resorted to on the street is only palliative, generally a hypodermic injection of morphine.

In a few cases the driver of the horse will notice that his horse is becoming affected (and most all of them at the present

time know) and will hurry him off to the nearest stable and get him off the street. If immediate treatment can be administered they often make good recoveries.

PATHOLOGY.—Under this head while the inquiry will lead to a confession of the imperfection of our existing knowledge, the post mortem does not reveal anything to base a conclusion on. The clinical symptoms are recognized by cramp or convulsive spasms of the muscles of superior spinal region. The muscles of the gluteal region, paralysis of one or both posterior extremities. We have also one ever-present condition. A coffee-colored urine which he may expel himself if he will stand long enough on one leg, or we may resort to catheterization or to pressure on the surface of the bladder.

This coffee-colored urine while it is a constant condition, symptomatic of this disease, is also noticed in other diseases. In this disease it is a condition of plethora. In other diseases that of anaemia. This history in both cases will be different. In the dark-colored urine of azoturia we have a condition due to a plethoric state of the vascular system which is favorable to some form of haemorrhage. This may be predisposed by overfeeding, sedentary habits or other causes of plethora. It occurs about the time when growth and development are proceeding rapidly. It has been supposed to be due to red blood corpuscles becoming disintegrated and dissolved or to a nervous disturbance leading to dilatation of the renal vessels with the consequent escape of some of their contents without rupture, or it is probable some may break down and become dissolved. It may be due to an obstruction in the ureters or to a retention of urine in the bladder. A uraemic poisoning may occur due to an accumulation in the blood. The circulation of which through the nervous and muscular systems lead to cerebral symptoms.

As has been stated a couple of days' idleness, rich food, and no exercise, in a young, vigorous animal are the three factors which are the causes of the invasion of this disorder. While, on the other hand, a horse might stand in his stable for two weeks

or two months under the same conditions and have no bad results. Two or three days seem to be more unfavorable than two or three weeks or months.

DIAGNOSIS.—Generally very plain, occasionally very obscure. There are times when it will require some close attention and study to make a diagnosis. In a mild form, it might be taken for a case of a colic; there may be only occasional flexion of ankles or none at all; there might be noticed a slight giving away at the stifles or a slight hardening of the muscles of the gluteal region. He may remain in this shape for half an hour or more, he will lay down and get up often and then suddenly develop the pronounced symptoms of azoturia; or again, a horse may come in lame from an injury to the elbow or stifle and show some of the symptoms of azoturia. We have also another type of horse to deal with which may often mislead. A horse that is not in the habit of lying down while in the stable. If this horse falls in the street he may make a good many unsuccessful attempts to rise, very often after laying in the street for a couple of hours and resting he will get up with assistance and walk home; but in a genuine case of azoturia, the differential diagnosis is easily established. We have our history and the dark-colored urine.

PROGNOSIS.—Either satisfactory or very grave. A great deal will depend on the intensity of the invasion. The degree of excitement or delirium and the rigidity of the muscular lesions involved. It is a disease of a great many presentations. Environment has as much to do with the successful treatment of this disease as almost any other disease. The style and temperament of the horse is also to be taken into account. The successful form of treatment of this disease in one locality will give negative results in another part of the country. In my locality a horse that is under treatment if, after twenty-four hours subsequent to his arrival at the hospital, he shows no delirium we can give a favorable prognosis. The main object is to control the delirium. If we can not get this under control our horse goes on to a rapid

dissolution. If the delirium abates we may have a complete or incomplete recovery.

SEQUELÆ.—In cases of complete or incomplete recovery, about one of the first things we will have to contend with will be bed sores of an extraordinary character. There will be great sloughs of muscular tissue at the angle of the ileum, at the coxo femoral articulation, at the stifle, at the elbow and injuries to the head. Another condition I have met with has been laminitis. I have had a hernia of the soles of both hind feet. I have had a malformation of both hind feet. The one which he has stood on, large and flat, the other small contracted. I have seen large osseous deposits in the hock from the same causes. Then also we have a great wasting away of the muscles of the patellar region due to nerve paralysis; he has absolutely no use of this limb. He may remain in this condition for an indefinite period. Some cases over a year before normal conditions are re-established. Nature does all the work. No treatment in my hands seems to be effectual in hastening a favorable termination. Another condition I have noticed in some horses. There has been a permanent structural change, horses with sway backs and long hips have changed to arched backs and dropped hips.

TREATMENT.—The plan of treatment which I have resorted to for over thirty years has given me some good results. I have never had a failure whenever I was able to administer the treatment quickly. On the other hand, I know I have lost many horses where prompt action was not obtained.

The plan of treatment is symptomatic—treat the cause. As this is a disease of plethora or engorgement, the treatment should be by rapid depletion. I say rapid, for this disease runs such a rapid course; medicinal agents alone will not give results. If a horse will stand on his front legs or can be held in a standing position for a couple of minutes until I have extracted ten or twelve quarts of blood from the jugular vein, and then follow this up with a large aloetic bolus, I have the most of my work

done. The copious bleeding seems to relieve cerebral congestion. My horse lies quiet and the medicinal agents act more promptly and urination is accomplished voluntarily. The supplemental treatment is warm water enemas and a careful watch as to the comfort of the patient.

In cases of anterior azoturia I would strongly advise the use of slings. In my opinion slings do more harm than good in posterior azoturia.

One invasion does not give immunity to a second invasion. I have had a horse with three attacks.

THE September issue of the *Journal of the U. S. Cavalry Association* contains an article by Veterinarian Olaf Schwarzkopf, entitled "The Structure and Functions of the Horse's Back and Their Relation to the Form and Use of the Military Saddle," and another by Dr. G. E. Griffin on "The Training of the Polo Pony," which proves that the doctor is a good judge of horse nature and an apt teacher of our charge, a knowledge so helpful and appreciated in the career of the army veterinarian.

THE *Berliner Thierarztliche Wochenschrift* gives an extract of an article by Dr. Kersten, Staff Veterinarian in a Bavarian Cavalry Regiment on the result of the examination of refracture of the eye of army horses made by means of the skiascope. Of one hundred horses so examined, 55 per cent. were myopic, 10 per cent. hypermetropic and 6 per cent. anisotropic, so that only 29 per cent. of the horses examined had normal sight. Later he examined 748 horses of a regiment. Of fifty-eight horses reported as shying, twenty had sclerosis of the lense and were myopic. He personally tried the different classes of horses under saddle to ascertain whether they had any characteristic action or behavior on account of their defective eyesight. He found that myopic horses invariably shy at near objects, often unexpectedly, while hypermetropic horses are liable to hesitate in advancing towards objects, approaching at a distance. The myopic horses were all more or less unsafe jumpers. None of the horses with normal eyesight actually shved, but a few of timid nature were close observers of the surroundings that were new to them, purposely selected for the trial.

EXPERIMENTS WITH SALUNGUENE-EXTERNAL SALICYLIC MEDICATION.*

BY EHINGER, D.V.S., NEU ULM, A. D.

Salicylic medication assumed unheard of proportions after the report on salicylic acid by Bertagnini, in 1855, and the successful decomposition of the acid by Kolbe, in 1874, into carbolic and carbonic acids; the ensuing clinical tests soon demonstrated its exceedingly favorable results in rheumatism and diseases of the joints. Its internal use in various chemical combinations usually was attended by annoying disturbances of the gastric, nervous or urinary systems, and this fact led Ruel and Bourget to try external applications, thus avoiding the alimentary tract. Extended research proved that absorption of salicylic acid through the skin does take place, owing to the volatile nature of the acid at the body temperature. With the discovery of the special keratolytic action of salicylic acid, there was manifested its peculiar power to penetrate through the skin into the lymph and blood circulation, and thus to act directly on the diseased parts. This property is inherent in but few remedies to a like degree. The resistance to penetration naturally exerted by the skin was overcome by the chemical union of appropriate substances with salicylic acid. Oil and fat solubility of such combinations, together with the lytic action of salicylic acid itself, must open the way through the skin to the lymph and blood circulation of cutis and subcutis. Thus was absorption of salicylic acid attained, the process being naturally most evident at the immediate point of application.

In endeavoring to meet the desire for as complete an absorption of salicylic acid through the skin as possible, Sterling and Bourget determined that a chief factor is the vehicle used for

*Translated especially for AMERICAN VETERINARY REVIEW.
(*Berl Tierarztl. Woch.*, No. 36, 1910.)

the solution, or the combination of salicylic acid, involving both the rapidity and the degree of absorption. The vehicles in use are: watery, alcoholic, etheral and oily solutions, fatty solutions, the saponiments, the recent vasols, vasogene and soapy substances. Of these the most generally accepted are the vasols and vasogene, since they combine medicinal agents to a greater extent and are more rapidly and more completely taken up through the skin.

In the unceasing attempt to obtain better and cheaper remedial agents success has only recently been attained in combining salicylic acid and its esters with soapy substances. Such a product of modern chemical research is Salunguene, a superfatted salicylic soap which embodies twelve per cent. salicylic acid and twelve per cent. salicylic acid esters, the acid being free and so especially available in therapeutics.

Salunguene is used externally only, is a specific in acute articular rheumatism, acute and chronic muscular rheumatism (lumbago, torticollis), neuritis rheumatica, etc., and has found general application in such cases. Hence my interest was directed mainly to determine whether this percutaneous use of salicylic acid is followed by any appreciable absorption of salicylic acid through the skin of animals. I tried to determine how soon after inunction salicylic acid appeared in the urine, together with the amount absorbed, as shown by the ferric chlorid reaction. Further, I observed the duration of elimination by the urine as indicating the period of efficacy of the salicylic acid in the body, and also the degree to which the skin was affected by the Salunguene.

The tests were made in horses, cattle, sheep, dogs and rabbits. Gradually increasing doses at short intervals, with the iron chlorid test, gave accurate data in regard to the elimination of salicylic acid through the urine, its degree and duration. This is of especial importance as establishing the exact dose and its probable intensity of action in the individual case.

My results showed a surprisingly large resorption of Salunguene through the skin, the use of a proper amount being fol-

lowed within an hour by the presence of salicylic acid in the urine. A further merit of Salunguene is its slight and pleasant odor; its stability, which ensures more complete absorption. This was especially evident where large quantities were used, the pungent odor of volatile salicylic acid being absent, though no attempt was made to limit this by protective dressings. This feature is important in the treatment of the larger domestic animals or where the remedy must be applied to extensive areas in rheumatism, in which the application of a protective dressing is not practical.

The experiments showed further that average doses of 0.03 grm. in the larger, 0.3 grm. for the smaller domestic animals per kilo body weight, were eliminated in thirty hours. Larger doses did not require an appreciably longer time. Only a larger amount was absorbed and thrown out in the urine. The smallest amounts giving confirmation of the resorption of salicylic acid were:

In the horse.....	0.016 g. per kilo body weight
In the cow.....	0.013 g. per kilo body weight
In the sheep.....	0.008 g. per kilo body weight
In the dog.....	0.017 g. per kilo body weight
In the rabbit.....	0.04 g. per kilo body weight

In no case was the application followed by any irritation of the skin, even where the dosage was high; the procedure itself was simple and pleasant, since most of the Salunguene is at once taken up by the skin. Important, too, is the fact that with proper closure of the container Salunguene keeps indefinitely, as I had occasion to note during more than a year. Heat, of course, favors loss of therapeutic power, but this can easily be avoided; cold has no influence.

My interest in the subject was aroused by Professor Gwenier, of Giessen, and in view of the many excellent results obtained with Salunguene my observations are bound to prove of service in extending the use of this very valuable preparation by veterinary practitioners.

SHOULD WE DISCARD "BOOPHILUS" FOR "MARGAROPUS"?

By D. E. SALMON, D. V. M., MONTEVIDEO, URUGUAY.

In my article entitled "The Eradication of the Cattle Tick," published in the March number of the REVIEW, the name *Margaropus* was used throughout for the tick which has become so familiar to American veterinarians as the *Boophilus*. This was done because of the statements of the entomologists that the change was required by the law of priority. Our Amreican authority, Nathan Banks, says, for example, "The replacement of the familiar *Boophilus* by this almost unknown name is a case where the inflexible application of the law of priority is greatly to be deplored, especially since there is no resulting benefit whatever to science" (A Revision of the Ixodidae, or Ticks, of the United States, p. 36).

That the change from the familiar *Boophilus* to the unknown *Margaropus* is deplorable, veterinarians will be even more disposed to admit than are entomologists, and for that reason it is not too late to inquire if even the "inflexible" application of the law of priority requires such a change. While I have not seen the single representative of the species *Margaropus Wintthemi* Karsch, 1879, examined by Neumann, and which appears to be the only specimen in existence, I am not disposed to accept it, from the descriptions which have been written, as belonging to the same genus as the *Boophilus*. The marked enlargement of the femur, the tibia and the protarsus in legs II., III. and IV., which is a character not seen in the *Boophilus*, is, for me, a sufficient reason to decline to accept it as belonging to the same genus.

Dönitz, who had reviewed this type, is disposed, according to Blanchard, to consider it as belonging to the same species as

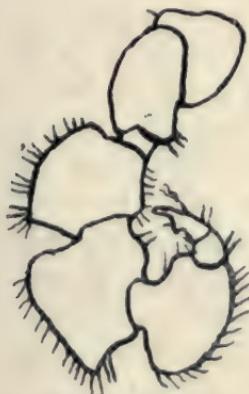


FIG. 1. Leg IV, *Margaropus Lounsburyi* (after Blanchard).



FIG. 2. Leg IV, *Boophilus annulatus* (after Salmon and Stiles).

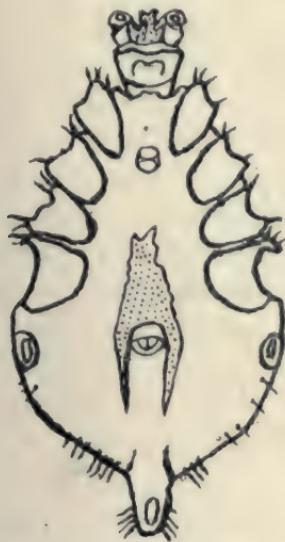


FIG. 3. Anal plate of *Margaropus Lounsburyi* (after Blanchard).



FIG. 4. Anal plates of *Boophilus annulatus* (after Salmon and Stiles).

the *Margaropus Lounsburyi*, and in this view Blanchard evidently concurs, since he retains both of the genera, *Boophilus* and *Margaropus*, and says of the latter that it contains "two

species only, perhaps reducible to a single one" (*L'Insecte et L'Infection*, Fasc. 1, p. 115).

After examining descriptions and drawings of the *Margaropus Lounsburyi*, it is clear to me that it should not be put in the same genus as the *Boophilus annalatus*, for not only the legs differ remarkably (compare figures 1 and 2), but the anal plates are entirely different, both in situation and number (figures 3 and 4). In the one case there is a single anal plate situated in front of the anus with a narrow prong projecting posteriorly on each side of the anal opening; in the other case four nearly equal anal plates reaching, and sometimes projecting beyond the posterior margin of the body.

For these reasons, I shall hereafter follow the example of Blanchard and use the name *Boophilus*, and hope that veterinarians generally will do the same. As a rule, I am willing to admit that entomologists are the proper authorities on entomological subjects, but recently they seem to have shown an over-anxiety to change old-established names in order to adhere "inflexibly" to the law of priority. By such changes they have sometimes, as in this case, caused much inconvenience and confusion in kindred sciences. It appears evident that the change from *Boophilus* to *Margaropus* was made without sufficient consideration, just as was the attempted change from *Boophilus* to *Rhipicephalus* a few years ago. Let us hope that more conservatism may prevail in these matters and that the law of priority will not be appealed to in order to justify changes that this law does not require.

DR. D. E. SALMON, former Chief of the Bureau of Animal Industry, U. S. A., is Director of the Veterinary School, Montevideo, Uruguay.

DR. E. H. AICHER, class 1910, Division Veterinary Science, Colorado Agricultural College, has been appointed Assistant State Veterinarian of Mississippi. The doctor's work will be chiefly the preparation of hog cholera serum.

A MISTAKEN DIAGNOSIS.*

By W. B. SWITZER, OSWEGO, N. Y.

When called upon to furnish a paper for this meeting, I hardly knew what subject to select, but I finally decided to give you a report of a case that came to me one year ago this present month. From the title I have chosen, "A Mistaken Diagnosis," I think I can almost hear some of you say, "Some poor fellow is about to get scorched for making a mistake." Let me assure you, the mistake being my own, that no one will receive unjust criticism.

One day, about August 1, 1909, while in Fulton, N. Y., Mr. W. G. Blakeman, of Little Utica, N. Y., called my attention to a bunch on the neck of a chestnut gelding which he owned. The horse weighed about 1,000 pounds. The bunch was situate about midway of the side of the neck, of about the size of a cocoanut and caused the horse to carry his head a little to one side. Upon careful manipulation I found a tumor, very firm and hard, and to a slight extent movable, between the muscles of the neck.

Upon asking for a history of the case, Mr. Blakeman said that he bought the horse five years before, a four-year-old colt at that time. He had had the horse but a few days when, while cleaning him off, he noticed a small bunch about the size of a walnut in the location described above. He watched it, and after a time made up his mind that it was growing, which it continued to do until the time of my examination. After careful consideration, I diagnosed it to be, in my best judgment, a cold abscess with a fibrous capsule. The extreme solidity of the

* Presented to the N. Y. S. V. M. S. Ithaca Aug. 1910

bunch made me quite sure that it had quite a heavy fibrous capsule.

On August 9, following, Mr. Blakeman drove the horse to my infirmary and made arrangements for an operation, which I told him I thought could be made successfully. On the following morning, August 10, we placed the horse on the operating table, chloroformed him, shaved the neck and carefully disinfected the parts. I then made a four-inch incision along the lower border of the tumor and lengthwise of the neck, cutting through the skin and the upper border of the Levator Humero muscle. I continued to cut until the depth of the incision in red muscular tissue surprised me, but after one more careful stroke of scalpel, I made an opening of one-half inch in length. To my surprise, blood spurted forth to the full size of the opening, and continued to bleed profusely. I saw that I must get to the source of the hemorrhage and stop it at once or the animal would die. I enlarged my opening until I could get three fingers in and then removed two and one-half pounds of thick, clotted blood, very dark in color. The flow of blood was so great that I could not, with the aid of Mr. Russel Guile (now a student of our esteemed State Veterinary College), as an assistant, keep the blood sponged away sufficiently to find the source. As the horse lay on his side, the cavity was a pond of blood, constantly boiling over. We quickly set the table up and thus let the cavity empty itself. I then found the leak to be a rupture of the superior cervical artery. This I took up and ligated with catgut by passing a curved needle beneath the artery. The wound at once became comparatively dry.

After the horse was safely in the stall, with his head tied in an elevated position, the owner told me that he had taken the horse to another veterinarian about one and one-half years before I saw the case and that the veterinarian had inserted a hollow needle into the bunch. Upon finding that the blood flowed freely, he withdrew the needle and told the owner that it was not ripe enough to open. He then put a blister over it and

told the owner to come back when it was ripe and that he would then open it. Mr Blakeman did not take the horse back again.

The horse was left with me until August 22, when the cavity was greatly reduced. A complete recovery was had and the only trace of the trouble which could be observed at the end of a year was the roughness of the hair resulting from the blister. This seemed a very remarkable case to me on account of the long continuance of this leakage.

THE University of Pennsylvania Veterinary School materially strengthened its curriculum this year by the addition to its teaching staff of Dr. Karl Friedrich Meyer as Assistant Professor of Veterinary Pathology. Dr. Meyer received his veterinary degree (D. V. M.) in Zurich in 1908, after seven years of study. From 1901 to 1902 he studied zoology and biology under the faculty of the Department of Philosophy at the University of Bale, Switzerland, his birthplace; then entering the University of Zurich, he continued his studies in zoology and comparative anatomy, and also took up the study of veterinary medicine, taking special courses in the laboratories under Prof. D. A. Lang. In 1904 he took special laboratory courses in chemistry under Prof. von Mueller and Prof. E. Meyer and special laboratory work in pathology under Prof. Kitt. Then, after a brief visit to the bacteriological and veterinary institutes of Vienna, he entered the University at Berne, where he received his federal state diploma. At Berne he became assistant to Prof. Ernst Hess, and later to Prof. Kolle in the Berne Institute for the Study of Infectious Diseases. Dr. Meyer came to the U. P. Veterinary School direct from the Transvaal, South Africa, where for the past two years he has been pathologist for the Department of Agriculture. Dr. Wm. J. Lentz has been appointed to fill the Chair of Anatomy for the ensuing year, succeeding Dr. S. J. J. Harger who died just before the opening of the school. Dr. Lentz is Assistant Professor of Surgery and Obstetrics in this institution, which title he still retains, although for this year he occupies the Chair of Anatomy. Dr. Lentz for several years assisted Dr. Harger and has consented to carry on his work for the present year. Dr. Lentz is a native of Philadelphia and obtained his preliminary education at the Philadelphia High School. He School of Veterinary Medicine, and has been identified with the school since his graduation.

IMMUNITY IN YOUNG PIGS FROM CHOLERA IMMUNE SOWS.*

By M. H. REYNOLDS, ST. PAUL, MINN.

Work at the Minnesota Experiment Station in connection with efforts to develop a cheaper and simpler method of immunizing hogs against cholera, has indicated during the past two years that young pigs from immune sows are highly immune to cholera inoculation, and that if such young pigs are not inoculated, this immunity is gradually lost. Inoculation with virulent blood during this immune period has given us permanent immunity; but pen exposure while nursing has not given satisfactory results.

We have done a considerable amount of work with young pigs from immune sows from many sources, with a very high percentage (practically all) of such young pigs, showing immunity under inoculation with highly virulent blood.

This seems to have developed a new principle and to offer great possibilities in the way of hog cholera vaccination work. If others have previously published results of work in this line, the writers would be glad to learn of it and to give due credit. We have done a small amount of work with pigs from susceptible sows which indicates that their pigs do not have any important immunity at birth, but have not done enough of this work to justify any conclusion. The duration of immunity for pigs of immune sows is a point which we are studying. Immunity for virulent blood inoculation seems to persist until more than five weeks of age.

We have done careful work with 88 pigs from 23 sows immunized by reason of having passed through outbreaks with a relatively insignificant loss from cholera in inoculated pigs.

* Credit for the original idea and general plan of this work belongs to Reynolds; credit for carrying out much of the original plan and for many helpful suggestions and criticisms and credit for the record work belongs largely to Beach.

Whether sows immunized by the serum-simultaneous Dorset-Niles method will produce pigs having such immunity at birth, we do not know; but have work under way which we hope will give reliable information on this point, when finished.

We do not know, as yet, that sow pigs inoculated with virulent blood while very young, will in turn produce in the next generation pigs having high immunity; but have some data which gives probability that this may be true. Nine pigs from two such sows have been tested and all proved immune to high virulence blood. Pigs from a third such sow are now under test.

The duration of immunity conferred on very young pigs by direct inoculation is a point concerning which we do not have sufficient data to justify an opinion, but this has been tested in one of our older litters with result that three pigs, two inoculated and one of the same litter, a check, kept until mature, showed by virulent blood inoculation that the check pig was very susceptible and died promptly; whereas the mates inoculated with virulent blood as very small suckling pigs continued in perfect health and later received the very large dose of virus required for hyperimmunizing.

It seems that this general principle may be developed into vaccination work of great practical importance.

Our work will probably be published within a few months as a Station bulletin and will report work done with young pigs from immune sows inoculated at from two weeks to sixteen weeks of age; it will report work done with pigs weaned and unweaned belonging to the same litter and inoculated at varying ages; also some inoculation work with pigs from susceptible sows.

IN renewing his subscription to the REVIEW, Horace B. F. Jervis, of Moulton, Me., says: "It is with pleasure that I enclose check for \$3.00 for continuance of my subscription to your inestimable journal. It is a means whereby any veterinarian can keep posted right up to date in any and all branches of the great profession that we have the honor to belong."

IMPACTION FROM ALFALFA HAY.*

By J. W. McGINNIS, D.V.S., MAYWOOD, NEB.

The reason I selected this subject is that in our study of alfalfa hay, we always consider it as a laxative food, and, until I met with it in practice I never thought of it producing a very aggravating form of impaction. But after meeting with several cases of impaction where the horse was being fed on alfalfa hay I begun to take notice.

There are two forms that I have met with. One is wherein impaction is caused by a very firm ball of improperly masticated alfalfa hay lodged usually in the floating colon. In this form it seems to me the primary cause is defective teeth as I have always met with it either in aged horses or in young ones of three or four years, when as we all know their molars are defective, due to the shedding of the temporary teeth.

The other form is wherein there is an enormous quantity of food in the large colon. In this form there always seemed to be an excessive tenaciousness to the contents of the bowel and while being semi-solid and well masticated it adhered together to such an extent that it was extremely difficult to get an evacuation of the bowel.

The symptoms are the same as in impaction from other causes. Either form may be associated with tympanites, and if so, the rolling, rapid breathing and other signs of pain are much more violent. Where there is no tympanites the horse will show stupidity, may either lie down or stand up, but usually alternates between lying and standing at long intervals, occasionally kicking at its abdomen or looking around at its side. Upon rectal examination (and, by the way, this is what I rely upon to give me the exact nature of most disorders of the bowels), one will

* Read at the annual meeting, Missouri Valley Veterinary Association, Omaha, July, 1910.

find either the hard ball in the floating colon or the semi-solid mass in the large colon. These symptoms associated with the history that the horse has been fed on alfalfa hay and the fact that the horse is of an age when defective teeth are common are sufficient to make a diagnosis.

Treatment consists of the judicious use of the numerous cathartics which we have at hand. Personally I have had better results from arecolin or oleum lini than from aloes. These are the only three I have used. In addition to the use of cathartics I usually use strichnine as a bowel stimulant or tonic. It is also advisable in the form wherein the hard ball has formed, to remove it with the hands as soon as it can be reached per rectum.

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REPORTS OF CASES.

A. V. M. A. CLINIC—OPERATIONS AND RESULTS.

Our readers were promised a full account of the operations performed at the A. V. M. A. clinic with results, in this issue of the REVIEW. We cannot report on all the cases with results, as many of them have not progressed sufficiently far to make the results of interest at this time; but we will give a report on nearly all of them *with results*; results on cases 1, 2, 3, 4, 6, 28 and 29 not having yet been reported.

5. Collie bitch, age 4 months: Oophorectomy. Anesthetic—Morphine, 1 gr., and atropine, $\frac{1}{8}$ gr. Operated upon by Dr. R. T. Whittlesey, of Los Angeles. The operation was performed without inserting finger into the abdominal cavity. A continuous suture tied in a bow knot was used. Dr. Whittlesey advised loosening the bow knot to meet the swelling in twenty-four hours, and on the third day the cutting off of the knot and allowing the dog to remove the stitches later. Anæsthesia was complete. This case made a splendid recovery.

7. Bay gelding: Thecal abscess, caused by penetrating street nail, which opened the navicular bursa. The animal was restrained by being put on an operating table perfected and invented by Dr. J. F. Ast, of San Francisco, Cal. Local anæsthesia was obtained by injecting 3 grains of hydrochloride of quinine and urea over the plantar nerves. Anæsthesia was pronounced satisfactory. The operation was performed by Dr. L. A. Merillat, of Chicago, Ill., doing a resection of the perforans tendon. Tincture of iodine dressing was applied. This horse was also afflicted with canker on all four feet. Result: Latest report is that this case is doing nicely.

8. Black stallion, age $2\frac{1}{2}$ years: Double Cryptorchid, both testicles being in the abdominal cavity. The animal was cast by Dr. George White, of Nashville, Tenn., the Knowles casting harness being used. Chloroform anæsthesia by rapid method. Anæsthesia complete in 5 minutes. Operated upon by Dr. David F. Fox, of Sacramento, Cal. Result: A splendid recovery.

9. Pointer dog: Tumor following a wound of two years' standing in left patellar region, weighing $7\frac{1}{2}$ ounces. Anæsthetic: Three tablets H. M. C. Compound administered one and one-half hours previous to operation. Pupils dilated to fullest extent. Very nervous, and it was necessary to administer ether to complete anæsthesia. Operated upon by Dr. J. T. Seely, of Seattle, Washington, assisted by Dr. Francis Abele, of Massachusetts. Tumor was removed with the ecraseur. Result: Recovery.

10. Bay gelding: Volar Flexion of left front leg. Animal cast by Dr. C. W. Fisher, of San Mateo, Cal., with the "Spencer Casting Harness." Anæsthesia: Three grains quinine and urea injected over seat of operation. Tenotomy of perforans tendon was performed by Dr. L. A. Merillet, of Chicago, Ill., who directed that the heels be lowered and the toe raised by high calks. Following the operation a bichloride pack was applied to the leg. Result: The latest report is to the effect that the animal is doing nicely.

11. Brown stallion, age 3 years: Exhibited as a cryptorchid. Dr. C. B. Outhier, of Salinas, Cal., attempted to demonstrate the flank operation; the method similar to that of spraying heifers. An incision was made in the left flank, but no testicles were found, and it was decided that castration had previously been performed. Result: Recovery.

12. Black and white bitch, age 3 years: Oophorectomy was performed by Dr. A. W. Boucher, of Pasadena. Torsion method used to remove ovaries. Ether anæsthesia was used. Result: Uneventful recovery.

13. Bay mare: Poll-evil of long standing. Placed upon operating table and chloroform was administered by Dr. J. A. Hill, of Alameda, Cal. The "Williams operation" was performed by Dr. L. A. Merillat, of Chicago, Ill., and the thermo cautery used. Result: Up to date the case shows little improvement.

14. Setter bitch, age 7 years: Tumor of mammary gland. Anæsthetic: Morphine, 2 grs.; atropine, $\frac{1}{8}$ gr. administered one hour and a half previous to the operation. Anæsthesia complete. Operated upon by Dr. David F. Fox, of Sacramento, Cal. Result: Recovery.

15. Brown gelding, age 3 years: Fibrous tumor, size of an apple in umbilical region. Animal was cast by Dr. Frank Griffith, of Hanford, Cal. This animal was very refractory, but

was cast with neatness and dispatch by western plains methods. Dr. Griffith was the recipient of great applause for his dexterity in securing this animal. Operation was performed by Dr. J. T. Seely, of Seattle, Wash. Result: Recovery.

16. Fox terrier, age 28 months: Autopsy was performed on this dog by Dr. A. V. Hall, of San Francisco, Cal., to demonstrate the result of an operation anastomosing the deodenum by end-to-end method and large and small intestines united by double blind end side by side anastomosis. The result showed the operations to be successful in every respect.

17. Dalmation bitch, age 9 years: This dog was autopsied by Dr. A. V. Hall, of San Francisco, Cal., to show the results of an operation performed by him twenty-six days previous when a sponge was removed from the stomach, and closure was obtained by the mattress stitch method. The results were perfect and dog was in splendid condition.

18. Bay gelding draft horse: Interfering sore three inches in diameter on each hind fetlock. Examined by Dr. C. L. Roadhouse, of Berkeley, Cal., who decided that the condition was not Bursatee, as was suspected by the local veterinarian who sent the case to the clinic. Tincture of iodine, 1 part, and tincture of ferric chloride, 3 parts, was recommended as a dressing.

19. Black gelding: Bursatee on left side of face and right fetlock and ankle. This animal showed a similar condition in previous years. It was sent to the California Experiment Station by Dr. David F. Fox, of Sacramento. Dr. C. L. Roadhouse, of Berkeley, examined the case and stated that no treatment had been used, but that the wounds were healing rapidly, due to the change to a cooler climate.

20, 21, 22. Three cows were exhibited by Dr. George S. Baker, of San Francisco, which had recently reacted to the Intradermal tuberculin test. The swelling of the caudal fold at the point of the injection was very pronounced in one case, and plainly visible in the other two. The injection had been made forty-eight hours previously in the left sub-caudal fold. An autopsy was performed on cow 22 by Dr. George S. Baker, of San Francisco, Cal. The case proving one of generalized tuberculosis.

23. Cow: Oophorectomy performed through the vagina by Dr. C. J. Schultz, of Seattle, Wash. Result: Recovery.

24. Cow: Oophorectomy performed through the left flank by Dr. O. A. Longley, of Fresno, Cal. This operation was per-

formed by cutting through the skin, then dividing by traction the muscle fibres, thus avoiding non-closure and hemorrhage. The skin only was sutured with three interrupted sutures. Operation consumed less than three minutes. Result: Recovery.

25. Black mare: Chronic Oestrus and Metritis. Oophorectomy was attempted by Dr. F. H. McNair, of Berkeley, Cal., in the standing position. Result: Shortly after the operation the animal suffered intense pain, dying in forty-eight hours. Autopsy revealed the following conditions. Abdominal cavity in the lumbar region contained from two to three quarts of encysted coagulated blood due to a ruptured blood vessel, peritonitis and metritis; the uterus being injected and containing a quantity of thin pus. Laceration of the peritoneal covering of the rectum. Both ovaries intact. Lumbar group of lymphatics absent.

26. Black stallion: Castration. Testicles were found in the lower part of the inguinal ring. Animal was cast by Dr. George White, of Nashville, Tenn., by the "Miles colt casting method." Operation was performed by Dr. J. A. Blattenberg, of Lima, Ohio. Result: Recovery.

27. Bay gelding, aged: Volar flexion of off front leg. Anæsthesia by the injection of 2 drachms of a 2 per cent. solution of cocaine. Operation was performed in standing position by Dr. J. H. Blattenberg, of Lima, Ohio, who divided the perforans tendon. The animal walked much better after the operation. Result: Late reports indicate that the animal would make a nice recovery.

30. Black Percheron stallion, age 7 years: Diagnosis—Böttcheromcosis of scrotum and testicles. The enlargement was fully 12 inches in diameter. Several fistulous tracts were discovered leading deep into the scrotum. This animal had been used in the stud until the last month or two, when the scrotum became so swollen that he was removed to the hospital for treatment. Antogenous vaccines and various treatments were used with no result. The animal was cast by Dr. Frank Griffith, of Hanford, Cal., and chloroform was administered by Dr. J. A. Hill, of Alameda, Cal. Castration and removal of the diseased tissue performed by Dr. J. H. Blattenberg, of Lima, Ohio. Result: For several days after the operation horse showed marked depression, refusing to eat. At the end of a week this horse commenced to pick up and gain his normal condition. On or about the tenth day he was led into a corral for his daily exercise. He showed great spirits, evincing a desire to play. Had been eating well.

While being exercised he suddenly dropped to the ground, dying in a short time. Autopsy revealed no reason for death, other than the presence of an anti-mortem clot in the heart. No peritonitis present. Operation wound seemed to be healing nicely. Animal for several days before death gave a normal pulse and temperature, and was apparently doing nicely in every respect.

Feeling certain that the following extract from a letter under date of October 14, 1910, from Dr. Wm. F. Egan, San Francisco (at whose hospital the clinic was held), to Dr. R. A. Archibald, Oakland, Cal., will prove of interest in connection with the above case, we reproduce it.

"I am glad that the location of the clinic was satisfactory, but I was sorry that the big stallion died.

"I do not know if you are aware of the facts concerning him. The horse, as I understand it, had very little exercise previous to being sent to the city; when he arrived, the streets were blockaded by the parade. The man had to take the horse around by Sixteenth and Valencia to avoid the parade, and I believe he crossed Market street somewhere near the Veterinary College, and had to climb hills and go by a circuitous route to reach the clinic.

"The stallion arrived, somewhat exhausted, at the noon hour, and soon after lunch was cast and operated on. The operation proved to be a very tedious one and occupied all the evening, until dark. In fact, they had to use a light in order to complete it. He struggled continuously, not having received an anaesthetic, and when he got on his feet was weak and almost pulseless. The pulse, as near as we could count them, were over 100 to the minute. We gave him a dose of aromatic spirits of ammonia, and fl. ext. of nux vomica; blanketed him, and put him in a comfortable stall, without food, for the night. In the morning he refused food of any kind, but took a few swallows of warm oatmeal water. He again received the ammonia and strychnine stimulant, and as his pulse could scarcely be felt, got a hypodermic of adrenalin chloride, which improved matters. For about three days he took no solid food, but took some warm oatmeal drinks with some ammonium chloride dissolved in them. After a couple of days his pulse improved, until I could count them at 80. They were, however, intermitting, and his jugular stood out distended, and showed jugular pulsations. A day or two before he died I told the man to walk him a little in the yard, to assist absorption of swellings of scrotum and sheath. The man

reported that slight exertion caused by leading him this way distressed him very much. I therefore told him to discontinue walking him. The walk was only in the yard, and very slow. I told the man the next day to let the horse out of the box stall into the long runway in the back stable. He rang me up on the 'phone and reported that when the horse walked of his own accord he appeared weak and staggered and fell. He gave him stimulant as above, and the horse got up, appeared better, and started to eat. After an hour or so the horse became distressed in breath again, staggered and fell. He again gave a stimulant, which improved him temporarily, but he soon died. On the morning of his death he appeared bright, but had the jugular pulsation, and weak, rapid, intermitting pulse. Post mortem showed white fibrous clots, extending a foot or more into the blood vessels. Had the horse been prepared, or the operation less prolonged, I think that he would have come out all right."

EXHIBIT OF PATHOLOGICAL SPECIMENS.

Preserved Specimens.

The members of the American Veterinary Medical Association that were in attendance at the San Francisco meeting are very much indebted to Dr. C. M. Haring, of the Experimental Station of the University of California, and Dr. Geo. S. Baker, Inspector in charge, B. A. I. at San Francisco, for the following exhibition of pathological specimens in connection with the clinic:

Carcinoma of left kidney—ewe.

Caseous lymphadenitis sternum—ewe.

Goiter from ewe.

Abscess in brain—wether.

Common pin embedded in right external lobe of liver—hog.

Kidneys showing inflamed areas—hog.

Melanotic tumor, abdomen of hog.

Skin showing healed lesions of hog cholera.

Nodular disease (oesophagustome) columbiarum—steer.

Wool ball from ewe.

Hermaphrodite—hog. (This specimen showed complete testicles, bladder, spermatic cord, penis, ovaries, fallopian tubes, uterus with perfectly developed cornu and vagina. The vulva was absent. Urine was discharged through the penis; the animal having the external appearance of the male.)

"Mule-foot"—front feet—hog.

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- Skin, Scabies—hog.
 - Actinomycosis of tongue—steer.
 - Nephritis of kidney—calf.
 - Small inflamed areas of kidneys—hog.
 - Tuberculous spleen of hog.
 - Tuberculous lungs of hog.
 - Tuberculous lymphatic glands* of hog.
 - Tuberculous kidneys of hog.
 - Tuberculous liver of hog.
 - Tuberculous mammary glands of hog.
 - Tuberculous arthritis fore-leg of hog.
 - Tuberculous lungs of cow.
 - Tuberculous diaphragm of cow.
 - Tuberculous omentum of cow.
 - Tuberculous spleen of steer.
 - Tuberculous lymphatic glands of steer.
 - Tuberculous kidneys of steer.

Frozen Specimens Not Otherwise Preserved.

Numerous specimens showing a great variety of lesions of tuberculosis of hogs and cattle.

Seven sheep heads showing lesions of lip and leg disease due to the bacillus of necrosis.

There were numerous other frozen specimens, a list of which is not obtainable.

VERMINOUS EMBOLISM OF CECAL ARTERIES.*

By J. L. BUCHANAN, Auburn, N. Y.

CASE No. 1.—Patient, a mare 18 years old, owned by a grain dealer and used irregularly for delivering. Condition was excellent. January 17th I was called to see this animal, and found a well developed case of lymphangitis combined with severe colic. Left hind leg very much swollen and painful. Lingual lymph glands swollen and hot. Made a rectal exploration and found everything normal. Peristalsis was very active, and soft feces were passed in small amount. Pressure on right abdominal wall caused pain and flinching.

* Reported at twenty-first annual meeting, N. Y. S. V. M. S., Ithaca, Aug., 1910.

Treatment.—Two grs. of arecolin were given, and a considerable amount of soft feces were passed. Two dr. doses of pot. iod. were given night and morning, and the affected leg irrigated with cold water. Two days later the animal was apparently normal.

March 12th, a. m., I was called to see this animal again, and was told she had not been doing well since the previous attack of lymphangitis. Her appetite was poor, sometimes refusing food entirely. When worked she scoured, showing mild colic later.

Evidently she had been suffering from pain a large part of the night, as she was well marked up. She would lie down and get up; kick at her abdomen with right hind foot, and look around at the right flank. No feces had been passed during night. Peristalsis was active on the left side, but very quiet on the right. Made a rectal exploration. Negative. Pulse and temperature normal. I knew this animal was given unlimited quantities of feed, and concluded it was a case for elimination. Gave $1\frac{1}{2}$ grammes of arecolin and followed with a tonic. She appeared to be all right the next day, but was left in the stable ten days. On March 22d was used in the p. m. delivering, and soon commenced to scour. The following morning, March 23d, she was found with the usual colic, except more severe. Peristalsis very active. Gave 1 ounce of chloral hydrate and followed with $\frac{1}{2}$ ounce doses of tinct. of opii. Prompt recovery. This time I suggested to the owner that we had a case of thrombus, or embolism.

Five days later, March 28th, was called again, and found the same set of symptoms. Gave same treatment as before, but she did not respond. Pulse and temperature normal, and remained in this condition until following p. m., when I got a hurry call saying animal was much worse. This time it was a different looking animal. Rapid shallow breathing. Pulse 98 and weak, temperature $105\frac{1}{2}^{\circ}$. Conjunctiva deeply injected. Nostrils dilated. Patchy perspiration, and every look about the animal one of extreme agony. Treatment was useless, and owner being away, we decided to let the disease kill her, instead of shooting, which would have been the humane thing to do. Death followed six hours later.

Post Mortem.—Cecum black and gangrenous and thickened. A thick coagulated exudate upon the mucosa varying in color from dark purple to a yellowish red. Two thrombi were found

in posterior aorta, and one in anterior mesenteric artery. The cecal arteries were followed up, and about five inches from their origin an embolus was found in each.

CASE No. 2.—I was called to post mortem this animal, but had seen it before, and knew its history. A four-year-old brought from the west in the spring, thin and run down. Later, it was turned out to grass. A few weeks afterward owner was notified that his horse was sick and scouring badly. The horse was brought to the stable and nursed for several weeks, requiring help to get up. It was traded off, and drifted from one swapper to another, and ultimately was landed on a farmer who lived eighteen miles from town. The horse was taken with colic before he reached home, and died in a short time.

The following day I was called to post mortem, the farmer thinking he might have a rebate coming from the swappers. I found a ruptured cecum, black, gangrenous, and the same dark purple exudate on mucosa; a thrombus in right branch of anterior mesenteric artery, and what appeared to be a recent embolus in the superior cecal artery. In the embolus were found strongyli about one-half inch long, and the mature worm in great numbers were found in the colon and cecum.

CASE No. 3.—A light delivery horse well along in years. Horse commenced to show colic at 4 p. m., and was driven until nearly six under the whip, hoping to drive out the colic. About 6 p. m. he was put in the stable, and broke away, ran into the street, and, as they said, acted like a crazy horse. At 7 p. m. I was called, and found the horse in great distress, covered with perspiration, and throwing himself about the stall. Pulse very rapid and weak. Respiration shallow and rapid. Conjunctiva deeply injected. Temperature, 104°. Considerable tympany and much straining. Used the trocar, and it seemed to give some relief. Considerable fluid, serum like, mixed with blood, escaped through the tube. I thought this was a case of twist, and attempted to make a rectal exploration. Found the pelvic cavity full of viscera, and manipulation caused such severe straining and pain I gave it up. The animal became quiet, and died thirty minutes later.

Post Mortem.—Ruptured cecum, black and gangrenous; the same thick coagulated exudate on mucosa, with some free exudate in the cecum. Thrombi in posterior aorta and anterior mesenteric artery, with embolism of both cecal arteries. Strongyli were found in the anterior mesenteric, and in the colon and cecum.

CASE No. 4 was a repetition of above. The most striking thing in the post mortem of these cases is the thick dark hemorrhagic exudate on the mucosa. In three of these cases the strongylus was found in the arteries, and examined with a hand lens. In all four cases the mature parasite was found in the colon and cecum.

Reeks, in his book, "The Common Colics of the Horse," devotes a chapter to enteritis, and describes perfectly the symptoms and lesions of these cases of acute embolism. As causes, he advances twist and embolism, but holds the belief that they are due to a septic infection of the blood stream. But why should this infection localize in the cecum and colon?

There are two good reasons why embolism of the colic and cecal arteries is more frequent than of the other visceral arteries.

First, the cecum and colon are the natural home of the parasite which bores into their blood vessels.

Second, the right branch of the anterior mesenteric artery is the largest. Hence, any debris gaining entrance to the mesenteric artery would naturally follow the largest blood stream into the right branch, which gives off the colic and cecal arteries.

The length of the right branch varies from one-half to two inches. The origin of the right colic and cecal arteries varies also. Sometimes the three arteries are given off at the same point by the breaking up of the parent trunk. In this case the right colic artery would carry the greatest volume of blood. Again, the right colic artery may spring from the middle portion of the right branch which continues onward, holding its size until it breaks up into the cecal arteries. In this case we have the combined volume of the two ceccals to offset that of the right colic. This is the distribution I found in my post mortems.

NOTES AND OBSERVATIONS ON RABIES.

By DR. M. J. JONES, SR., Veterinarian, Blanchester, O.

At eight o'clock a. m., October 10, 1910, I was called by phone to one, William Snyder, three miles from my office; arrived in about one hour, was shown a gray gelding weighing about 1,050 pounds, said to be twelve years old.

He was in a box stall with a low manger in front of him. I was told this horse was apparently well until the morning of the

9th, when he seemed to be very nervous and excitable, seeming to want to defecate and urinate frequently. He was continuously rubbing his left nostril over the false nostril, and looking very much excited. During the day of the 9th he was running in a pasture with several other horses; the owner noticed during the day he would be quiet for quite a while, then suddenly he would be aroused and run frantically to some object and rub his nostril and would keep running from place to place until the nervous spell passed off, which would be in a few minutes. He continued to act this way during the night of the 9th. Next morning he seemed much worse, being more nervous and excitable; was taken out of pasture and placed in a box stall with low manger in front; at this time I was called and arrived in the course of an hour.

The owner stated that twenty-one days prior to the first time they noticed anything wrong with this horse, he was placed in his stall for the night; on the owner going to the stable in the morning, he found a stray dog lying on the hay in front of this horse; the dog looked very tired and haggard. On arousing him he slunk out in the yard, where the house dog attacked him. He paid very little attention to him, turning and snapping at him three or four times and finally got away. The owner noticed nothing wrong with the horse excepting a slight tumefaction over the left nostril, which had a scratch on the surface; this seemed to disappear in a few days.

Observation and Symptoms.—First saw this horse standing quietly in box stall with eyes partly closed and looking very much exhausted; respiration accelerated; on being aroused by our presence, he came suddenly forward to the manger, rubbing his left nostril frantically against it. The muscles about the mouth were drawn back over his teeth and he gasped as if he was dying. He grabbed the muscles of his breast, straddled out his hind parts as if trying to urinate, and groaned fearfully. His tail stood erect, all the abdominal muscles seemed greatly contracted; he crouched lower and lower until he lost his balance and fell, still holding on firmly to the skin of his sternum. After a few fearful struggles he regained the standing posture; he stood in the corner quietly, very much exhausted. After a few minutes, on again being aroused, the muscles around the mouth became contracted and he yawned as if he was dying. He then grabbed the skin of the forearm, straddled out the hind parts, drew his yard, which became erect, and with tail elevated, he crouched lower and lower until he fell. After a few desperate struggles he again stood on

his feet and stood quiet, breathing very hard. These paroxysms were repeated at intervals of five or ten minutes, each one becoming more aggravated until in the course of two hours paralysis of posteror extremities set in, and he could not get on his feet; but still continued to hold fast to the skin of the forearm and breast with his teeth. After he was down there seemed to be but very little intermission of the paroxysm. He continually retained his hold of some part of breast or arm. I diagnosed rabies and had the horse immediately destroyed; also the house dog which had not shown any signs of rabies.

There is one symptom I wish to mention particularly, that is not generally mentioned by writers on this subject; that is the excitable state of the genital organs, which was very marked in this case, and many others I have seen, the mare showing every symptom of oestrus, and in the perfect horse and gelding, erection of the penis with every preparation for copulation.

POISONING BY ERGOT.

By D. D. KEELER, V.S., Salem, Ore.

I promised myself that I would try and report a case or two of what we, the farmers and stockmen, are pleased to call "Staggers," though in reality I believe is poison by ergot. found in this the Willemette Valley in oat-hay or straw, darnell grass and buckwheat and stored in the system until such times as the system may by being overtaxed, or weakened, and thus brought into the proper condition for it when it attacks the muscles and weakens them so the horse staggers.

I have not found in any of the books or any report of cases the semiology of these cases of which many are seen in this valley every year, and many die. On August 23d I was called by Mr. Measor to come to his place in the Red Hills, south of town, to see a horse affected in some way so he could hardly get him through the stable door without his hitting both sides, although the door was of usual size. I had my suspicions what was the matter, for I asked him over the phone what kind of hay are you feeding and he said oat-hay of the finest kind. I immediately prepared to go, and on the road I met a neighbor of his and as he stopped he said. "Did my boy with the wood wagon show you a horse that did not seem quite well?" And I said "No." "Well," he said, "she could hardly get out of the barn

this morning, she seemed so stiff, but we have been working them pretty hard hauling wood and that may be the reason." I asked him the kind of hay he had been feeding, and he said fine oat-hay without a bit of fern in it. (I might say here that for many years and, in fact, until some experiments on feeding of fern was made, the old settlers attributed this disease to the fern in the hay, but such conclusions have been proven untrue.) I prescribed for this horse on the conclusion that it was ergot poisoning and went on to Measor's; found a twelve-hundred-pound bay Clyde horse probably 8 years old, square built and in good flesh, heart's action 86, temperature 102.2° , appetite good, respiration about normal when quiet, but would blow some if moved much; gave treatment and ordered him fed on bran mash and green corn. No more oat-hay was to be given. For a day or two he could hardly get to the water, it being in a rather hard place for him to get; he had to go down a narrow ravine and would tilt from side to side. This horse seemed to be affected most in the heart.

In four or five days I was called to see the neighbor's horse. They had been working this animal for several days after they found something was the matter with her, which is very unfortunate for the horse so affected, but their appetites are good and so the owners are not aware of their serious condition; her heart's action 64; temperature 104.8° . If moved at all she would breathe very fast, if turned quickly, would tumble down. She had been fed oat-hay right along while giving her the medicine. This animal was affected most in the lungs and hind parts. As this disease goes on, they will be unable to stand or get up when down; the appetite is lost and they become clogged; spasm set in, they lay on the side and by continually pawing describe a circle, and in a few days die. There seems to be a swimming sensation, especially marked when they are on a plank floor; they are somewhat relieved from this when put on the ground. I have seen as high as twenty head of horses in a travel of one day affected with this trouble along the foothills of the Cascade range of mountains, and every one was being fed on oat-hay cut from little cleared patches along the level lands or ravines in these hills.

These kinds of feed do not affect unfavorably cattle or sheep, probably from the fact that they regurgitate their food and the ergot is not stored. The above horses spoken of made a fine recovery, the second one just being used a little at this date, September 16th.

PENETRATION OF THE ABDOMINAL CAVITY—RECOVERY.

By A. B. ELLIS, D.V.S., Los Angeles, Cal.

A handsome black mare was presented at the hospital, with the history that she had ran away and jumped over a low iron fence. On being placed upon the operating table and examined preparatory to dressing the wounds, an extensive laceration was revealed just behind the last rib, about on a level with the spur vein on the left side. The hair was clipped from around the wound, the ragged edges trimmed off, and a probe inserted, which came in contact with a hard substance, which, on removal proved to be a piece of an iron picket about three inches long and curved on the end, which had broken off with the mare's weight after penetrating the abdominal cavity. None of the intestines were punctured, however, but all that kept them from coming out was a fold of the omentum lying over the lacerated muscles. After trimming off some of the omentum and examining the small intestines to see that none of them were injured, the peritoneum was pulled together and stitched with catgut.

A piece of cotton soaked in a weak solution of permanganate of potassium was then laid over the stitched surface, the muscles and skin drawn over it and allowed to remain for forty-eight hours to allow swelling to take place to close the perforation through the abdominal muscles. The patient was placed on a drachm each of extract of belladonna and fluid extract of nux vomica, three times a day. Her bowels not having moved on the second day, a physic ball was given and resulted in a free movement within the next twenty-four hours. During the two weeks that the mare has been under treatment since her entrance into the hospital, the wound has been dressed with a 1-1,000 solution of pyotktanin. There is no sign of hernia or other complication at this writing, and there is every reason to believe she will make a complete recovery and be in condition to discharge from the hospital in another week.

PRESIDENT GLOVER, of the A. V. M. A., is "on the job," and has been since the close of the San Francisco meeting; with the determination of making the 1911 meeting, wherever those who have the matter in charge elect to hold it *one to be remembered*. That determination and the spirit in which it is expressed insures the success that the doctor aims at.

ARMY VETERINARY DEPARTMENT.

THE VOTE FOR LEGISLATIVE FUNDS.

The news, telegraphed from San Francisco, that the American Veterinary Association had voted a contribution of \$500 in support of the Army Veterinary Bill, now pending before Congress, has been received with genuine gratification by the army veterinarians, who are anxiously hoping for the enactment of the bill.

It is not only recognized that the fund is large enough to be helpful, but that by taking this step the association has proven to have passed the state of mere sympathy expressed in well-meaning resolutions as of former years, and that it has felt itself now strong enough and able to actually support by proper means those measures before Congress that happen to be of fundamental need for the life and development of parts or of the whole of the veterinary profession.

What now remains to be done is to strengthen the legislative committee of the association by the addition of representatives as well versed in their line of work as are, for instance, the members of the committee on diseases. It is not every man's gift, nor is it the average veterinarian's choice, to speak and argue with legislators. A ripe judgment, wide experience in life, tactful and skillful proceeding, patience yet push mingled with professional enthusiasm, are a few of the requirements and natural endowments to be possessed by those veterinarians who are to play the role of launching the hopes and desires of our profession into safe and effective channels of legislative procedure and enactment.

Although there has sprung up another measure before Congress that seems to have aroused the thoughts and resentment of our colleagues in civil and official life, and perhaps rightly so from the condition under which our profession is progressing at present, yet we sincerely hope that the small Army Veterinary Bill will not be lost sight of by our representatives of the legislative committee. Here is a bill, half passed, sanctioned by the

War Department, with little or no objection to legislators, but unpushed. There is nothing in this bill to arouse the pride, patriotism or personal interest of congressmen; it has no other motive than providing a little better for one of the hundreds of branches of our complicated governmental machine. So far we have been counseled not to antagonize the good will of congressmen by unduly pushing our bill, but to wait for their convenience of action. That this policy will bear no result has become quite clear, as also that nothing but the "offensive" will bring victory. We must urge, argue, even use force, if need be. We have been strengthened in this conclusion by the advise of a well-known legislator himself, who recently said: "There is no ghost of a show for your bill unless you can bring it out on the floor of the house at once, and then hang on to it with dog's teeth. The bill is important to you, but it is not so to congressmen."

Another difficulty to be encountered lies in the determination of the War Department to insist upon the enactment of the "Extra Officers' Bill," as the main bill needed. It is a costly measure, one not favored by many congressmen, and its argument will consume much time to the detriment of the several other military bills still pending. Our veterinary bill, therefore, will not be urged by the War Department, friendly as it stands towards it. The urging is left to ourselves, and we have been told so. Besides, there are several other smaller military bills, each one having their advocates, and they are all expected to be passed during the coming short session of Congress. All this is not particularly encouraging, neither is it entirely discouraging.

The time is fast approaching for our legislative committee to make plans for the campaign for our bill. We hope that the money so liberally voted will not be spent in useless entertainments to legislators, but to defray the legitimate expenses of the members of that committee and their helpmates. Let us have a clean cause. Publications, letters and stamps, telegrams, railroad fares constituted the expense list that in 1901 nearly gave us a complete Army Veterinary Corps. We hope and trust that similar tactics will enable our friends of the committee to be successful in their present efforts. The glory will all be theirs, and their names will be chronicled in the annals of American veterinary history among those who have stood in the front rank in a fight that was righteous, for progress and of lasting good.

O. S.

CORRESPONDENCE.

BUFFALO, N. Y., October 24, 1910.

Editors AMERICAN VETERINARY REVIEW:

On page 60, October REVIEW, Dr. Fred Foster, Camp Gregg, P. I., writes to know what is meant by "Mule-foot Hog." The following may help out.

Clipping from paper, Washington, D. C., some years ago says:

"National Zoo, Washington, D. C., Has Solid Hoofed Pig—Gift of Farmer from Indian Territory. So far as known there are only two such in United States east of Mississippi, second owned by farmer in Sequachee Valley, Tenn. Darwin has account of such pigs in his "Origin of Species," as there were three in England at the time he wrote this book. The solid-hoofed hog is not a freak, but a genuine case of reversion to a primitive or ancestral type. Tracing back to the elotherium, from which all members of the swine family are descended, which animal had a solid hoof."

Dr. Frank Baker, Supt. of the National Zoo, Washington, D. C., would probably be able to furnish you considerable data on this subject.

Respectfully yours,

DR. FRANK A. CRANDALL,
Curator Zoo, Buffalo, N. Y.

SOUTH OMAHA, NEB., October 21, 1910.

Editors AMERICAN VETERINARY REVIEW:

Answering inquiry in regard to "mule-foot hog" in October REVIEW, "mule-foot hog" is a term used to signify that the hog has one or more of its cloven feet replaced by a solid foot.

Where there is less than four mule feet on a hog, the remaining foot or feet may show a variation from the normal foot by having an extra claw between the principal claws, or one of the principal claws may be much larger than the other, or there may

be a mule foot with two grooves running from the top of the anterior wall to the sole.



I am unable to state whether or not these variations show the evolution of the mule foot. The photograph shows a dissected mule foot. The hoof is shown separate.

Yours truly,
ANDREW ENGLISH, Vet. Inspector.

BLACKSBURG, VA., Oct. 14, 1910.

Editors AMERICAN VETERINARY REVIEW, New York City:

Replying to the inquiry of Dr. Foster of the Second Field Artillery, I will state that the "mule-foot" hog is one in which the hoof is not cleft. There are separate pedal bones enclosed in one hoof that, in some respects, resembles the hoof of a mule. These hogs are of a bacon, or probably more of a razor-back type, and were quite common in Oklahoma a number of years ago. They are being bred and advertised as immune to hog cholera, but competent authorities deny this statement. They do not pos-

sess qualities that would appeal to the average swine breeder, except that they are good rangers and have the peculiar conformation of the hoof already mentioned.

Yours truly,

N. S. MAYO,

Va. Agr. Exp. Sta., Department of Animal Husbandry.

EAU CLAIRE, Wis., Oct. 17, 1910.

Editors AMERICAN VETERINARY REVIEW, New York City:

Replying to the inquiry of Dr. Fred. Foster in the October REVIEW, for a definition of the term "mule-foot hog," we occasionally find in the course of inspection of hogs in a large packing house a hog in which the feet instead of being cleft as in normal feet, has the two digits united into one, so that the foot resembles that of a mule. Perhaps that is what the doctor refers to. I recall the finding of a heifer in which a similar condition appeared.

Respectfully,

Wm. FOTHERINGTON,

Inspector, B. A. I.

BIBLIOGRAPHICAL ITEM.

337 E. FIFTY-SEVENTH STREET, NEW YORK, October 27, 1910.

To the Editors of the AMERICAN VETERINARY REVIEW:

I have just finished reading the book, "The Gait of the American Trotter and Pacer," an analysis of their gaits by a new method, written by Rudolf Jordan, Jr., and published by Wm. R. Jenkins Co., New York, which you sent me to review.

It was exceedingly interesting reading to me, putting forth many new mathematical problems, excellently illustrated, relating to the balancing and proper shoeing of the trotter and pacer. This work would be interesting and instructive to any reader. If the author's principles were more generally known and applied, much equine discomfort and pain, due to improper shoeing, would be obviated.

Yours truly,

HARRY D. GILL.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

BY PROF. A. LIAUTARD, M. D., V. M.

BAGELLI'S TREATMENT OF TETANUS BY HYPODERMIC INJECTIONS OF CARBOLIC ACID SOLUTION [*Lieut. Col. J. Moore*].—This is the record of the treatment of four cases according to the directions of Bacelli, viz.: the injection every two hours for the first thirty-two hours, and less frequently afterwards of one drachm of pure acid in solution (5 to 10 per cent.). The first horse received a purgation first, and then the acid. After five days the animal grew worse and the treatment was changed for extract of belladonna. The animal began to improve at once and finally got well.

The second case was a mare. She also received a purgative in the shape of an aloetic ball and then Bacelli's treatment, which was kept up for five days. Chloral hydrate per rectum and bromide of potassium were also given. The mare recovered in twenty-six days. In a third and a fourth case the result was different. Both animals died and it was said that the fourth might have recovered had it not been for the carbolic acid treatment. Neither of these cases, however, ought to be considered as conclusive and further trials are to be carried out.—(*Veter. Journ.*)

AN INFLAMMABLE COLIC DRAUGHT [*William Beddard, M. R.C.V.S.*].—A mare has colic. A drench is prepared of ether nitr., oil tereb. and olium lini. As it is administered, the mare makes a plunge and falls with her mouth wide open on a lighted gas bracket. The contents of the mouth caught fire, and although the light was put out at once the mouth was badly burnt and the lower lip has since retracted to such an extent, owing to cicatrix, that it has become useless as an organ of prehension. The mare for eating has learned to use her teeth and upper lip.—(*Veter. Journ.*)

INTERESTING CASE OF RHEUMATISM WITH COMPLICATIONS.—[*Arthur Payne, F.R.C.V.S.*].—A four-year-old Great Dane has the tail badly bruised and ulcerated. One inch of it at the extremity is necrotic; and it has been bleeding copiously on and off for weeks. It was operated by the amputation of three inches of it being taken off. Informed that the dog had some difficulty in getting up and seeing him very lame on the left hind leg, with painful swelling on the front of the metatarsus, rheumatic troubles were suspected and salicylic acid treatment prescribed. This was carried out for two days, when the dog was found dead the following morning. At the autopsy there were found two infarctions in the spleen, a livid patch in the epicardium, at the apex of the heart and one also in the right auricle. Slightly attached and sprouting from the mitral valves was a pinkish granular mass. The endocardium was thickened and the lungs were almost hepatized, oedematous and of a bluish color.—(*Veter. Journ.*)

ABSCESS IN A CAT DUE TO B. PYOCYANEUS [*Prof. J. A. Gilruth, D.V.Sc.M.R.C.V.S.*].—Ten-year-old cat has a tumor as big as a cherry plum on the back of the neck. It has been opened twice, but gradually refilled. The entire tumor was completely removed. It was a purulent cyst, with dense fibrous walls. Cultures of the discharge gave growths of B. Pyocyanous with a few colonies of *staphylococcus aureus*.—(*Ibidem.*)

LIPOMA IN AN AUSTRALIAN COCKATOO ASSOCIATED WITH ENLARGED LIVER [*Prof. J. A. Gilruth, D.V.Sc.M.R.C.V.S.*].—This *Cacatua Rosiepilla* has a growth situated subcutaneously under the abdomen, as large as a mandarine orange, soft, well defined and readily separated from the surrounding tissues. It was suspected of being malignant, and advice was given to have the bird destroyed. It was done. At post mortem, the viscera were found normal except the liver, which was large, pale, mottled with greyish areas and soft, friable and fatty. The tumor was also composed of fatty material. After all, the case might have been successfully operated barring the usual risks that attend operation on birds.—(*Veter. Journ.*)

VENTRAL HERNIA [*J. H. Parker, M.R.C.V.S.*].—Cart mare is found with a swelling in the right flank. It is a hernia the size of a small foot ball. Cast and chloroformed, an incision is made and the bowel exposed. Gentle pressure fails in keeping it

in the abdomen and it comes out as fast as it is pushed in. With a great deal of difficulty it is, however, pushed back with the fist of one hand, although the mass that protruded would have filled an ordinary stable bucket. The abdominal wound was then closed with ten interrupted silk sutures and that of the skin with six more, when the mare was allowed to rise. The operation was performed without any antiseptic preparations. The animal was placed in an open shed with her hind quarters elevated. She was not allowed to lay down. The temperature rose but one day up to 102° . There was considerable swelling at the seat of the operation, and the mare got well without any complication.—(*Veter. Record.*)

NOTES ON CLINICAL CASES HYGROMA—BIER'S TREATMENT [*Prof. O'Connor*].—Five-year-old gelding has for twelve months had a swelling round the knee, which has been growing. It had the consistency of a chronic bursal enlargement, with thick walls. It is fluctuating and situated below the knee at the postero-internal aspect of the limb. Painless to the touch, it did not cause lameness, although it is as big as a hen's egg. Pressure upon it did not cause distension on the outer aspect of the part, but above and behind the knee. It was diagnosed as a case of hygroma or subcutaneous cystic collection or perhaps a distension of the carpal sheath. Considering the various treatments that might be resorted to, the professor preferred opening, evacuating and injecting tincture of iodine as the one likely to have the best results. This was done under local anaesthesia and blood tinged serum allowed to escape. The cavity being then explored, it was found running three inches above the lower end of the radius, with its lining infiltrated with calcareous material. Iodine was injected, but failed to bring a complete cicatrization. Sulphate of zinc in powder was used with no better result. Finally hyperhaemic treatment was tried. A rubber tourniquet was applied above the knee and left on three hours. This was repeated for two days in succession. Great inflammation and swelling followed. The bandage was left off and when after a few days the swelling had somewhat subsided, it was found that the cavity of the cyst was smaller, was closing and the discharge reduced. The treatment was followed more or less regularly afterwards by the owner; but the cavity closed entirely, and although there was considerable thickening remaining, the animal traveled sound.—(*Veter. Record.*)

CYST IN SINUSES OF A COLT [*Same Author*].—Strong yearling colt, six months old, had a discharge from the nose. Now it has become copious, mucoid from the right nostril. Respiration is very loud. There is a large swelling over the frontal and superior maxillary sinuses and a thin walled cyst is felt in the right nasal cavity. Dullness over the sinuses by percussion. Being cast, on the examination of the nose, the cyst is bursted and reddish glairy fluid escapes. The frontal and superior maxillary sinuses are trephined with three large openings, similar fluid as that of the nasal cyst fills the sinuses and escapes. Antiseptic irrigations are prescribed, but after a fortnight there is no improvement except in the breathing, which is no longer loud. Cast again, the openings of the sinuses are made larger and from the cavity are removed with a curette soft spongy bone tissue with empyronic fibrous structure. Tincture of iodine and iodoform and boric acid are used, and after four weeks, having brought the case under control, the openings of the sinuses are allowed to close gradually and the animal is sent home, where recovery is completed. Eight months later the animal presented again the same symptoms. A similar operation was performed, and in addition an opening was made in the nose from the lowest part of the frontal sinus. The horse died the second day after the operation, with an attack of colics. Post mortem was disappointing as only a small chronic abscess of the stomach was found.—(*Veter. Record.*)

TUBERCULOSIS IN A SCOTCH TERRIER [*Prof. Craig*].—Since a fortnight this dog's abdomen has grown bigger. His condition is poor and his belly touches almost the ground. The digestive apparatus is normal. Heart seems muffled at auscultation. Palpation reveals no fluid indication of ascitis. On manipulation a well defined swelling is made out in the anterior portion of the abdominal floor. Laparotomy is performed. When the abdomen is open a large dark swelling presents itself; it is as big as a man's head. It is attached to the lower part of the diaphragm and in connection with the liver. The swelling is an abscess containing clear reddish colored fluid. The liver is the seat of numerous large tubercles. It is a case of tuberculosis and the dog is chloroformed to death. The big abscess had developed in the posterior face of the liver. There were found smaller ones on the hepatic surface and numerous miliary ones on its thickness. The hepatic and mesenteric glands were enlarged

and caseous. There were some tubercles in the omentum, stomach, intestines, and posterior face of the diaphragm. One on the kidney. The thorax showed tuberculous pleurisy, the lungs were filled with miliary tubercles, and the thoracic lymphatic glands were also diseased. Tubercle bacilli were found in abundance in the lesions.—(*Veter. Record.*)

FRENCH REVIEW.

BY PROF. A. LIAUTARD, M.D., V.M.

INTRA-THORACIC OESOPHAGEAL JABOT IN A COW [Mr. Robin, Sen. Student].—Similar cases are very rare in bovines, if they are frequent in horses.

A Dutch cow, some fifteen or twenty days previous, presented symptoms of indigestion with formation of gases, which subsided with the administration of drenches, and since, after each meal, she vomits all that she swallows. All kinds of treatment seems useless. She is brought to the veterinary school clinic. There it is observed that rumination is all gone, there is no return of gases by the oesophagus, no eructuations, but a slight intermittent tympanitis. Constipation is marked. When food is presented to her, she takes it, chews it and after two or three swallows, mastication stops, the animal stretches her head on the neck, and two or three balls of food are rejected covered with saliva. Ingestion of liquids is also impossible. Oesophageal obstruction is diagnosed and confirmed by catheterism, a very small probang cannot pass through. Tuberculin is injected to find out if perhaps there is not pressure of the oesophagus by enlarged tuberculous mediastinæ or bronchial glands, but the animal dies during the night before the first temperature could be taken. At the post mortem the digestive canal and two last compartments of the stomach were empty, the rumen and reticulum only contained some hard food having offensive odor. There is limited adhesive peritonitis on the diaphragm and the cesophagus is normal in its abdominal portion. But in the thoracic, just as it is about passing through the diaphragm, it is the seat of a baggy dilatation, some 20 centimeters long formed by the thin mucous membrane protruding through the ruptured muscular coat. The sac contained about two pounds of food,

finely divided, forming a compact hard mass undergoing putrid fermentation.—(*Rev. Veter.*)

FALSE LUXATION OF THE JAW IN A DOG [*Mr. Bosselut, Sen. Student*]—An eighteen-months dog keeps its mouth open and it cannot be closed. The dog was found in that condition in the morning when taken out of the kennel. He is lively, caressing and tries to eat. There is no fear of rabies; at any rate if attempts are made to bring the jaws together, it is found impossible to do it. The opening of the jaws is solid and due to mechanical cause. The lower jaw is deviated on one side, but both incisive arches seem to be well opposite each other. The right masseter is a little harder and a little more projecting than the other. Diagnosis is made of luxation of the tempor-maxillary articulation. The ordinary method of reducing the same fails to return the bones in their position. The dog is put under the influence of chloroform and even then repeated efforts to close the mouth fail entirely. Anæsthesia is kept up and by request of the owner the dog is put to sleep to death. The head is examined and dissected. The muscles being removed, it is found that there was no luxation. The articular surfaces are in contact, but on the right side the coronoid process, instead of resting in the temporal fossa against the internal face of the zygomatic arch, has been pushed outwards and is held fast against the external. The muscular insertions on the process have been torn off. Practitioners will do well to bear this possible displacement of the coronoid process which, had it been suspected in this case, might have been relieved and the dog's life saved.—(*Rev. Veter.*)

A CEREBRAL TUMOR [*Mr. A. Picard, Army Veterinarian*].—A mare shows very severe cerebral troubles. She pushes against the walls of her box, has violent attacks during which she rushes on surrounding objects. She dies after twenty-four hours. Diagnosis had been made of acute meningo-encephalitis. At post mortem all the nervous centers are examined. The meninges are very congested and here and there the seat of thickenings. The left hemisphere appears more congested than the right. Opening of the right ventricle gives escape to quite an abundant flow of citrine yellow liquid. In the left ventricle, there is a fibrinous yellow mass, very vascular on its surface, pressing against the walls of the ventricle and adherent to the

choroid sheath which forms for it a kind of peduncle. The tissue of that growth is rather hard, it is reddish in color. Examined as to its histological structure proves it to be a myxo-sarcoma which had taken its origin in the dura-mater.—(*Rev. Gene. de Med. Vet.*)

GENERALIZED INTESTINAL SARCOMA WITH RETROGRADE MESENTERIC ADENOPATHY AND PERITONEAL METASTASIS [*Dr. Antonio Maja*].—A dog was suspected of having tuberculosis. Tested, he gives no reaction. He was in very bad condition, ate poorly and gave signs of gastro-enteritis, which was treated successfully. His condition continues to be bad and his owner gives him up. He dies shortly after.

Post Mortem: Abdomen—No exudate to speak of. On a level with the paracoccal glands there is a growth as big as the fist, in the thickness of the mesentery and to which the omentum is attached. It is hard, whitish and homogeneous. Starting from it, a large number of similar small tumors are observed along the mesenteric blood vessels. There are miliary ones on the omentum. The congested liver is full of centers of generalization. There are two or three in the kidneys. In the Thorax: No exudate, sus-sternal glands are involved in the neoplasm and also the tracheo-bronchial glands. The thyroid gland is the seat of an hemorrhagic tumor partly bony. The tumors were typical lympho-sarcoma and that of the thyroid an osteo-epithelioma.—(*Ibidem.*)

OBSTRUCTION OF THE LARGE COLON BY AN AEGAGROPILE [*Prof. Doctor Fontaine, Army Veterinarian*].—An eight-year Anglo-Normand horse, a brilliant animal, refuses his food, stretches himself behind and make expulsive efforts. Placed in observation he is soon taken with colic. First dull and slight. No passage from the bowels. Rectum is empty, bladder also. There is no excessive fullness of the pelvic arch of the large colon. Repeated oily purgatives, arecoline, large intestinal irrigations, removal of few hard fecal matters from the rectum, all seem useless, and this condition lasts for five days. When on the sixth a small ball of manure is expelled and followed by purgation which is abundant. The colic disappeared and the animal looks for food. Six days later he gets uneasy, has colic again by spells, lays down carefully puts himself on his back and then assumes the dog's sitting position to finally get up. He

is always making strong expulsive strains. Intestinal congestion is threatening. Notwithstanding treatment, the animal dies after eighteen days of sickness.

Post Mortem.—It showed hypervasculization of the intestines, specially the large colon; stomach and small intestine are empty, the large contains some liquid and in softened excreta an ægagropile weighing two kilogs, muriform and made of felted alimentary substances with calcareous deposits in its center.—(*Rev. Gen. de Med. Veter.*)

PATHOLOGICAL ADHESIONS OF THE PELVIC ARCH OF THE LARGE COLON WITH THE BLADDER—NEPHRITIS—ENORMOUS RENAL CALCULI [*Same Author*].—This thoroughbred mare is eight years old. She has slight colic. Defecation is scarce. Only small and coated balls are dropped. Temperature, respiration and circulation are normal. Carefully nursed, she improves. But the coprostasis remains the same. Oily purgatives are repeatedly given. Rectal examination revealed sensibility of all the pelvic organs. Suddenly violent colic of intestinal congestion appear which are relieved by venesection and opium and morphia. The mare is in great state of prostration and she is fed with milk and receives two litres of physiologic serum every day. She dies after one month of treatment.

Post Mortem.—Generalized peritonitis with numerous peritoneal adhesions. Of the two principal, one unites the spleen to the inferior walls of the abdomen and the other unites the pelvic arch of the large colon to the bladder. In the center of this there are also several abscesses. In the cavity of one there was a small piece of straw. The bladder was shrunk and contained but little urine. There is perinephritis. The right kidney has an abscess in the cortical substance as big as a nut. The left kidney contained three large calculi, encysted and yet free. There was also pericardial exudation, hypertrophy of the heart, enlargement of the spleen and cystic ovaries.—(*Rev. Gen. de Med. Veter.*)

A CASE OF OESOPHAGISM [*Mr. Berton, Army Veterinarian*].—Before being operated a mare receives 20 grammes of sulphonal in 100 grammes of dry bran. During the operation she struggled very much. Taken afterwards in her box, she takes a mouthful of hay and suddenly mastication stops, the expres-

sion becomes anxious, the lips are stiff and the head is extended on the neck, which is the seat of violent spasms. These are accompanied with groans and abundant bilateral escape of viscidous matters from the nose, and yellow discharge mixed with crushed hay. During three-quarters of an hour these spasms came at intervals of ten minutes and gradually less in severity. After a few hours everything is nearly normal, except some general depression. There was no pain, except after three days, when cervical myositis was well marked.—(*Rev. Vete. Mil. and Rev. Gen.*)

BULBO-CEREBELLOUS TUBERCULOSIS IN A DOG [*Dr. L. Marchand, Prof. Petit and Douville*].—The lesions found in the nervous centers of this dog consisted principally in a tumor, hard, irregular and adherent, situated in the cerebellum, and with also many hard whitish granulations on various parts of the bulb. Tuberculous bacilli were found in those neoplasms.

The symptoms presented by the animal were very peculiar. At first he only exhibited anorexia and a great sensibility, hyperesthesia, on the back of the head and on the neck. But after a few days great troubles were manifested in locomotion. He staggers in walking, at each step his body balances from one side to the other. Left loose, he goes in short trot or walks head down with his eyes fixed and staring, careless of the calls of his master, yet avoiding the objects in front of him. As he stops, he sits down and remains as in a state of cerebral torpidity. If then pressure is made on the neck, he jumps of a sudden, raises himself straight sitting on his haunches and then turning once half round upon them, resumes the standing position and goes about with his short-step trotting gait.

What is peculiar is that this sudden vertical position and of sitting on his haunches, he only assumes it after a moment of rest and when the poll of his neck is being touched. And if this is done while he is walking, he does not mind it and continues with his ataxic movements, inco-ordinated, until he drops down again. In his kennel the animal remained quiet, laying down, the nose in his bedding, indifferent to the food that is put near him, but chewing and swallowing it well if it is placed in his mouth. The general sensibility and tendinous reflexes were preserved. Tumor of the cerebellum was suspected, and the dog destroyed. He presented the lesions alluded to above.—(*Revue de Mede. Veter.*)

BELGIAN REVIEW.

BY PROF. A. LIAUTARD, M. D., V. M.

TWO CASES OF GANGRENE [*Mr. C. Verlinde*].—1. *Gangrene of the Foot*.—This was in a horse lame since two days when seen by the writer. He then was very lame on the left fore leg. This was wrapped up with a coarse cloth held with three thin cords, one on the coronet, another immediately above the fetlock and the third near the knee. The whole was covered with a coat of dry clay. When this apparatus was removed, the marks of the superior cord above the fetlock were seen by a circular depression about one centimeter deep. The horse had a dry corn on the foot. But certainly not enough to account for the excessive soreness. However the hoof began to get loose around the coronet and the case assumed a bad aspect. Four days later the foot sloughed away, gangrene of the lower extremity of the leg strangulated by the cord fixed above the fetlock. The animal died in great agony after two days, the owner not being willing to have him killed.

2. *Strangulation of the Arm in a Dog*.—A shepherd dog is lame on three legs. The left fore is swollen from the elbow down to the paw. The claws are thick and spread apart by the swelling. A close examination revealed the presence of a rubber ring passed round the arm. It is imbedded in the skin and flesh and concealed by a thick edge of inflamed tegument. With a guarded bistoury the rubber is cut off. It was a ring one millimeter thick and two or three wide, having such limited power of construction that it seemed difficult to understand how it could have done such a mischief. The removal of the ring stopped the progress of the gangrene and recovery was completed in three weeks.—(*Bullet. de Med. Vet. Prat. Malines.*)

ACCIDENTAL AMPUTATION OF THE TONGUE [*Mr. C. Verlinde*.]—Just bought a horse, said to be a little ugly; is taken to the blacksmith to be shod. To keep him quiet, and under better control, a rope is passed in his mouth, secured round the neck to hold his head down and tied to the bar of the stocks where the animal was placed. When the shoeing is finished and the horse was left free, bloody saliva is observed escaping from the mouth. Taken to his stall, the horse refuses his food and blood

collects in his manger. The inferior lip is swollen, bloody saliva escapes abundantly at the commissure and a transversal circular deep wound is on the tongue involving almost its entire thickness. The free extremity of the organ is swollen and holding just with a thin peduncle that remains as part of the tongue. As the case is likely to be the subject for a law suit, nothing can be done except cleaning with boric water solution. The tongue kept on getting more swollen, fetid odor came from the mouth and finally after the inspection of the experts appointed by the courts, the gangrenous extremity was amputated with the ecraseur. It measured 11 centimeters in length and weighed 260 grammes. This piece was hard blue-greenish in color and had a very offensive odor. The animal seemed to have some relief but had great difficulty in eating and drinking. Cicatrization took place quite rapidly. The horse was sold by order of the courts and lost sight of.—(*Ibidem.*)

EPIZOOTIC PAPILLOMATOUS STOMATITIS OF GOATS IN BELGIAN CONGO [Mr. Ch. Ficket].—This disease, which has not been described so far, attacked twenty young animals out of a herd of thirty-three, and five have died after severe diarrhoea and progressive loss of condition. The disease started when the young goats were but two weeks old and lasted between ten and fifteen days. The principal lesion was the growth in the mouth of papillomatous vegetations without ulcerations. These vegetations were filiform or irregularly ramified, more abundant on the anterior part of the lower jaw and interfering with the closing of the mouth and the motions of the tongue. This organ was also covered with some but less prominent. There were some again on the palate. The nostrils were free. The teeth were covered by the vegetations but were healthy and firm in their alveoli. The microscopic examination showed that the lesions were superficial, involving the papillary body of the mucosa only and not the deep layers of the mucous membrane. The contagious nature of this attack is not rigorously established and feeding is considered as the probable cause. Similar attacks of the disease have been recorded in other occasions in various parts of the Belgian Congo.—(*Annales of Bruxelles.*)

TUMORS IN THE HEART OF A HORSE [Mr. J. Hauben].—While in harness a three-year-old colt drops down and is unable to get up. Paralysis a frigore is diagnosed. Six litres of blood

are taken away from him and suddenly he gets up, goes eating and appears as if nothing had happened. Some three years later the writer is called for a five-year-old animal, recently bought, which behaved in the same manner, and after three hours got up also. Fifteen days later this horse has another attack, and then comes out the history that he has been subject to them, has been sold and resold on that account. He is the same horse as the one seen three years before. At his last attack, his general condition is bad, pulse 90, respiration quick and deep, temperature 39.5° C. Percussion indicates dullness over the heart, which on auscultation gives irregular sounds. The animal dies after forty-eight hours of treatment of digitalis. Post mortem: Heart is quite large, softer than usual. Right ventricle is dilated and almost filled with an irregular and soft tumor, which is attached by peduncle to the fibrous circle of the auriculo-ventricular opening. Floating in the cavity, it measures 15 centimeters in length, 7 in width and 5 in thickness. The right auricle is normal. In the left ventricle there is also a tumor, similar to the other, but smaller. It is fixed on the base of the sigmoid valves. On section, the two tumors, identical in nature, are homogeneous and presented the macroscopic characters of myxomatous tumors.—(*Ibidem.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D., Buffalo, N. Y.

LOCAL ANÆSTHESIA BY MEANS OF COCAINE-ADRENALIN [*Prof. Dupuis and Van den Eckout*].—In order to induce prolonged anæsthesia in the region of an operation, the author employs for a local anæsthetic cocaine, alypin and stovaine combined with adrenalin. The latter is a general and local vasoconstricting agent, which when brought into contact with a mucous surface or injected into the subcutaneous tissues contracts the blood vessels, resulting in an intense anæmia of those parts which have absorbed the solution without producing a general reaction. This vasoconstriction lasts a few hours. When we add adrenalin to cocaine we prolong the anæsthesia three hours, and at the same time minimize through this slow process the danger of poisoning by the rapid resorption of the cocaine. For many reasons the author selected cocaine, stovaine and alypin in the comparative

experiments carried out upon horses, and in consequence advises the following formulæ to be prescribed: Hydrochlorates of cocaine or stovaine or alypin, 20-30 grammes; hydrochlorate of adrenalin, 1/1000—5 drops; distilled water, 10 grammes. This solution is employed by the author for the diagnosis of foot lameness, also in various operations, tracheotomy, cartilaginous quittors, punctured wounds, canker and so on. Anæsthesia sets in from 15 to 20 minutes after the injection and lasts three hours. Stovaine and alypin have the same properties as cocaine, only that they are somewhat less poisonous. As for the horse, which bears the action of cocaine tolerably well, it is not of so much importance, nevertheless in canine practice we must be cautious, as symptoms of poisoning have been already reported after the customary doses were administered. The dose of both agents is the same as that of cocaine. The author remarks in conclusion that in consequence of the knowledge of the action of this drug, it is no longer practicable to perform operations. As the Javarts, the separation or removal of the sole and so on, without previously rendering the seat of operation insensible to pain.—(*Berliner Tier. Wochenschrift*, No. 19, 1910.)

THE horse supply of every civilized nation is short of the increasing demands. All Europe wants more horses. Drafters for the city and farm work, cavalry for the great armies, and coach and carriage horses, in spite of the automobile. All of these horses are in urgent demand at higher prices than ever before known and the growing cities and short supply of good horses has forever banished cheap prices. America is the only country that can increase the supply for an export trade. We have introduced all of the improved breeds of Europe and improving our twenty million farm horses up to the world's market demands. The prices for draft horses impel the farmers to breed drafters, and when the military authorities pay prices to justify, the farmers will raise the cavalry horses in type and numbers to meet the demands. France and England are eager for more cavalry horses, and France pays higher prices, but the draft horse demand is so urgent and prices are so high that even the high priced coaches are neglected and all of the French provinces are raising Percherons for the American trade and high city markets. Already the more active demand of fall trade has set in with increasing eastern buyers.—Extract from Editorial, *Livestock Journal* of September 8, 1910.

SOCIETY MEETINGS.

NEW YORK STATE VETERINARY MEDICAL SOCIETY.

The twenty-first annual meeting of the New York State Veterinary Medical Society was called to order by President Hollingworth promptly at 10 a. m., August 25, 1910, in the lecture room of the New York State Veterinary College. The president immediately introduced the Hon. Randolph Horton, Mayor of the City of Ithaca, who bid the society a hearty welcome. Mayor Horton spoke intelligently of the advancement of the veterinary profession and its great importance in the scientific and economic world, dwelling particularly upon its great value in preventive measures and protection not only to animals, but also the health and welfare of mankind. Mayor Horton closed his remarks by paying a pleasing tribute to the honor and respect of Dr. Jas. Law for the great work and worth he has been not only as a teacher of veterinary medicine but as an educator and citizen to be admired and loved.

In response on behalf of Cornell University, Mr. Mynders Van Cleef immediately made those present feel that not only was the City of Ithaca glad of their presence but that they were equally as welcome under the roof of Cornell University. Mr. Van Cleef invited them to inspect other departments of the university so that they might see other lines of education that are being carried on in that great institution. He, like Mayor Horton, could not resist reviewing Dr. Law's history briefly, going back to the time of his first association with the university and giving great credit to him for the progress of the veterinary profession and the veterinary department of Cornell University, explaining how gracefully the mantle of this great man had now fallen upon the worthy shoulders of Dean Moore. He outlined the hope of the university in the enlarging of the Veterinary College and spoke of the necessity of well-trained veterinarians to care for the nearly two hundred million dollars worth of livestock in this state.

The box containing the books having been delayed in the express office, the minutes were not read at this time.

The secretary's report was then read. This report pointed out the different methods pursued during the past year in augmenting the membership of the society; endeavoring to bring back into active membership many of the old guard who had become indifferent to the society's work; also pointed out that the year had been equally as successful in gaining new recruits, since there were more applications for membership than in any other year since the organization of the society. The advancement in membership in the last decade was also pointed out, it being an increase of about a hundred. The secretary also spoke of the failure during the past legislative season to amend our law and the necessity of union in our ranks; he suggested that a committee be appointed, such committee being large enough to take in the views of men who have given time and thought to the legislative question and men in whom the society had confidence, to draw up or frame an amendment to our law, which would be satisfactory to the society to the support of this bill, and it was his opinion that there would be no question but what such a bill could become a law. Regularly moved, seconded and carried that the secretary's report be accepted and placed on file.

Dr. H. J. Milks, chairman of the Committee on Therapeutics, read a well-prepared report which was discussed by Drs. Berns, Williams and DeVine. Morphine and compounds containing it was particularly discussed and it seemed to be the opinion of all that morphine was an unsatisfactory, if not a dangerous, drug in equine practice, but, on the contrary, of considerable value in canine practice. Dr. Berns expressed disappointment that new medical preparations were not more deeply gone into and invited the experience of the members present along lines of new treatment. Drs. DeVine and Williams reported some cases of morphine poison in horses; Dr. Williams gave his opinion that chloroform in inhalation was perhaps the best antidote for this condition.

Motion was made at this time that the president's address be deferred until after dinner that evening.

Report of Legislative Committee was then read by Dr. Kelly. After some discussion by Drs. Kelly, Fish, Switzer, Williams and DeVine, report was referred to the Executive Committee.

Dr. Berns gave an extensive and interesting report on animal diseases. He dwelt particularly on the glanders situation

as affecting the City of Brooklyn and the stables which came under his immediate supervision, claiming that most of the trouble was in small stables of the poorer class where one or two horses were kept and not in large stables that were under veterinary supervision.

The society at this time adjourned for noon recess, to meet again at 2 p. m.

Meeting reconvened at 2 p. m. and discussion of Dr. Berns' report on animal diseases was again taken up by Dr. Williams; he stating that most of the isolated cases of glanders occurring in the rural districts were horses that had been sold in the City of New York, or some other large city, and shipped into the country and resold by dealers. Dr. Williams desired an expression as to how this matter could be changed and how this practice could be checked. He cited a case which recently came to the clinic without a history and without the usual manifestation of clinical symptoms; the animal being very stiff in her spinal column and could not lower her head or raise it above the level of her body, or turn it to the right or left, and carried a continuous fever. Glanders being suspected, the animal was tested and suspicions verified..

Dr. Hollingworth made inquiry as to the extent of glanders in the different localities and what measures could be taken to prevent the selling of glandered horses in New York City and their distribution throughout the state.

Dr. W. L. Baker reported that there was very little glanders in and about Buffalo.

Dr. Berns expressed his opinion from thirty years' experience that horses that are well cared for, under favorable conditions, will in many cases make a recovery from infection if slightly affected with glanders, and stated that if all horses in New York were tested we would be surprised at the number that would react to either the mallein or agglutination test. It was his opinion that fully 20 per cent. would react to these tests. Dr. Berns stated that it was his practice to place suspected horses under treatment of Fowler's solution of arsenic and iodide of potassium; this treatment is sometimes continued from two to five months. Dr. Berns is of the belief that in taking blood for the agglutination test it should be taken before mallein is injected.

Dr. Williams asked Dr. DeVine if there was any provision in the statute that would prevent the sale and shipment of these

animals from New York City. Dr. DeVine stated that there was nothing in the statute that would cover it any more than the sale of diseased animals, and that where an animal was not known to be diseased or showed any evidence of disease, the present statute would not cover it. Dr. Milks was of the opinion that there were nearly as many affected horses shipped from Philadelphia as there were from the New York market.

Dr. Cochran stated that the present indemnity allowed by the state was a disadvantage in the control of glanders. Dr. Ellis in contradistinction pointed out many advantages of the present state law in the control of glanders.

Dr. Stone gave his experience in Binghamton and his belief is that most infected animals came from New York City. It was the general opinion that but few cases originated with green horses from the West.

Dr. Law stated that it was not a question of their coming from the West, or any other point, but whether they have come from where glanders exists, and that New York seemed to be the danger point. He made special mention of the danger of infection from cars. Dr. Kelly stated that he found but very few cases of glanders among western horses, but usually traced it to horses that came from Boston or New York.

Dr. Hollingworth stated that we as practical veterinarians ought to be able to get together and make resolutions that would be an advantage in the control of this disease.

Next in order was the report of the Committee on Clean Milk by Dr. R. C. Reed. Dr. Reed gave a brief report, attributing much credit to the work done by President Hollingworth in getting out and distributing pamphlets, as well as having taken the matter up at different society meetings and publicly. President Hollingworth and Dr. Law each stated a case where the veterinarian's advice on the feeding of milk and care of an infant had been of great value. Dr. Reed cited a case in his private practice showing the close relation of baby troubles with the bacteriological condition of milk; the condition being so marked that the physician in charge of the case called his attention to the great improvement of the child with the improvement of the condition of the milk.

NEW BUSINESS.

The secretary then read an invitation from the general manager of the Niagara Falls Bureau of Conventions asking our

society to hold its next meeting at Niagara Falls. Another communication of interest to the society was one of the National Health Department, in which they asked for the co-operation of the society relative to establishing a National Health Department. Regularly moved and seconded that this communication be referred to the Executive Committee. Similar action was taken on a communication received from the World's Panama Exposition Company.

A list of the members over three years in arrears was then submitted to the Board of Censors. After the Board of Censors had regularly examined the same, Dr. Berns, as chairman, reported as follows: "Under the circumstances I, as acting chairman of the Board of Censors, think that we shall have to allow the law to take its course, and drop these members from the roll as active members of the association." It was regularly moved and seconded that the report of the Board of Censors be adopted. Carried.

Reading and discussion of papers was then taken up. Dr. David W. Cochran presented a very able paper on "Azoturia." Dr. Cochran's paper was practical in its entirety and provoked lively discussion by Drs. Ellis, Williams, Kelly, Patton, Berns, Baker, Switzer, Stone, Morrow, Hollingworth, McCrank and Law.

All agreed pretty much on the conditions which seemed to bring on the disease as well as its general characteristics. Slightly different methods of treatment were spoken of by the various gentlemen engaged in the discussion, but blood letting and keeping the animals as quiet as possible seemed to be the treatment favored by most. The necessity of stopping the animal at the very onset of the disease was agreed to by all to be the most important step to take. It was likewise agreed that the weight of the horse as well as the altitude of the locality has much to do with the prognosis.

Dr. Moore, as chairman of the Committee on Necrology, read his report, paying a most loyal tribute to the departed ones of our profession as follows:

"The Committee on Necrology has to perform the sad duty of officially calling the attention of the society to the loss it has sustained during the past year through the death of one of its members and of two distinguished leaders in the profession. The phenomena of life and death are constantly before us, but not until those who are trained to do humane service are called

to the 'Great Beyond' do we fully realize the exacting demands of the irretrievable law that sooner or later terminates all individual activity. There were living among us a year ago those interested and active in the attainment of professional service and ideals, who to-day are known only by their works and the memories of their personal friendship and helpfulness. Thus it is that our ranks are ever being broken and the real progress made by the fallen becoming crystallized as fundamental knowledge for the new recruits. In the inventory of our professional estate we should ever be mindful of the twofold origin of our possessions; the lesser of them is found in our individual effort and discipline, the greater springs from the life work and sacrifices of others. In the struggle for professional preferment there is a tendency to forget the constantly increasing inheritance that is being handed down from the lives of other members.

"As we assemble for the first time after the departure of our member and co-workers we are depressed by a sadness that words cannot express. In our absolute wonderment as to why valuable young lives should be stricken out or the years of the worthy be ended, the words of the prophet of old that 'at evening time it shall be light' suggest that eventually the mysteries of life and death may be explained. To-day as we mourn the loss of a member and co-workers we should be mindful that by their departure we are obligated to make our own lives more valuable because of the inheritance they have left us.

DR. E. H. NODYNE.

"Dr. E. H. Nodyne, an active member of this society, lost his life in an automobile accident in Fulton, N. Y., early in the spring of this year. Dr. Nodyne was a graduate of the Ontario Veterinary College and for eighteen years has been engaged in the practice of his profession. For the last eight years he had resided in Fulton. His professional work was distinguished by his activity as a meat and milk inspector, and as a leader in his community in a rational eradication of bovine tuberculosis. In these as well as in his private practice he had made a commendable record. In his untimely death the City of Fulton has lost a good citizen and the veterinary profession has been deprived of an active worker and one who gave much promise for a still greater future.

DR. LEONARD PEARSON.

"Early in the fall of 1909 the news reached us that Dr. Leonard Pearson had died at Spruce Brook, Newfoundland. Dr. Pearson graduated from the Veterinary department of the University of Pennsylvania. In 1890 he graduated from the veterinary department of the University of Pennsylvania. In 1897 he was elected its dean. In recognition of his valuable services the University of Pennsylvania conferred upon him in 1908 the honorary degree of Doctor of Medicine.

"Possessed of a logical understanding of his profession and its needs, eloquence and perfect clarity of expression, a large intellectual and social sympathy and a dominant instinct for progressive action, he was accorded a foremost place by his fellows and co-workers in the field of veterinary education and practice. These same attributes won for him a like regard in the deliberations of all bodies having to deal with veterinary sanitary science. His memory is cherished as a man whose life, though short, stands as a notable example of one who gave his years unselfishly and devotedly to the upbuilding of his chosen profession. Measured by years, his life was short; measured by achievement, he lived long. As a scientific veterinarian in the broad sense we honor his memory; as a man and a co-worker we mourn his loss.

DR. ANDREW SMITH.

"The death of Dr. Andrew Smith occurred about three o'clock, August 15, 1910, at his home in Toronto, Canada. Dr. Smith was born at Dalrymple, Scotland, in 1835. He studied veterinary medicine under the renowned Professor Dick, of Edinburgh. In 1861 he came to Canada in response to a call from a large number of horse owners who felt the need of better veterinary service. In 1862 he gave a course of lectures in Toronto to a small class of students. This was the beginning of the Ontario Veterinary College over which he presided until 1908, when it was taken over by the University of Toronto. Dr. Smith was one of the most widely known veterinarians in the country. Three thousand veterinary students have passed under his instruction. At the opening exercises of the University of Toronto in 1908 Mr. Nelson Monteith, their minister of agriculture, and Dr. Rutherford, veterinary director-general of Canada, spoke most eloquently of the broad influence of his work.

"Dr. Andrew Smith was the second pioneer in veterinary education in America. A contemporary of Liautard. His strength of character and his genial spirit are attested by the devotion of his many pupils and the recognition of his high social and civic honor by his fellow citizens. He labored under many difficulties, but he lived to see the college wrought out by his own efforts become a part of a great educational institution with bright promises for the future. Unlike many others, he was granted the high privilege of serving mankind for more than three score years and ten and of being a witness to the transfer of his high professional trust to a board of directors charged with the sacred duty of bringing to his single-handed efforts the wealth of modern physical and biological sciences. His life circumscribed an epoch in veterinary education and his death is lamented by hundreds of those who as pupils sat at his feet.

"It seems fitting that this society should spread upon its minutes this expression of our appreciation of the life and of the work of the departed, and of our sorrow at the loss of our members and these distinguished leaders, whom in life we honored as conscientious workers and pioneers in their respective fields of veterinary activities.

"(Signed) V. A. MOORE, Chairman:
"R. W. ELLIS,
"J. A. McCrank,
"Committee on Necrology."

It was regularly moved and seconded that the report be received and spread upon the minutes.

The meeting then adjourned to have photographs taken in front of the building.

"Pursuant to adjournment a paper was read by Dr. Leonard, entitled "Therapeutics of H. M. C." This paper was discussed by Drs. Baker, Ellis and Hollingworth. All reported that this drug seemed to work very satisfactorily in small animals, but decidedly unsatisfactory in the horse.

The next paper presented was that by Dr. Udall on "Vaccines." Dr. Udall supplemented his paper by some demonstrations all of which were interesting and instructive, particularly to those who have not the advantages of such an institution as Dr. Udall has to carry on such interesting and valuable work.

Meeting was then adjourned.

Meeting again called to order at 8.50 p. m. in the dining room of the New Ithaca Hotel. Dr. Berns occupying the president's chair.

Dr. Baker moved that a copy of the report of the Committee on Necrology be mailed to the respective families of the deceased. This was regularly seconded and carried.

President Hollingworth then gave his address. Hollingworth like, his address showed evidence of extensive thought and considerable application during the entire year to the society's necessities and advantages; his familiarity with the professional and agricultural interests throughout the state was evidence of his activities during the year, that he might formulate for the society's consideration the changes most desired as he saw them. He presented such views in his characteristic optimistic way which gave spirit to the doubtful and depressed as to the future of our profession. He suggested that our society consider the publication of the proceedings and urged every member to make special effort to increase its membership. He reviewed our failure to receive legislation asked for the past year and suggested that any proposed amendment be taken up in our society and acted upon so that the Legislative Committee may go to the legislature asking for things that the society as a whole are in favor of. He spoke with regret of the failure of our veterinary colleges to receive adequate appropriations from the hands of the legislature, and made a strong appeal to the profession to assist in such good causes; and added that every one should take an interest in clean politics. In closing, he pointed out our duties in the protection of human life by proper education along the lines of inspection of meat and milk products, and in turn the public's obligation to us for work of such a character.

Second Day—The meeting of the second day was regularly convened at 10 a. m. Paper was read by Dr. B. Switzer, entitled "Mistaken Diagnosis," which was particularly interesting to every practitioner; the subject being a horse presenting what appeared to be a deep-seated abscess which proved upon investigation to be haematoma involving an artery. It impressed all who heard it with the necessity of cautious procedure as to the use of a knife in vascular regions.

Dr. Morris, as chairman of the Committee on Medical Jurisprudence, then favored us with a very interesting talk on what the committee had been doing in advancing the suggestion of utilizing prisoners who had been condemned to die for experi-

mental purposes with a hope of determining certain principles that would be of great advantage to the human race at large. The committee's report was regularly received.

The chairman of the Auditing Committee next reported that they had audited the books of the secretary and treasurer and found them to be correct. It was regularly moved, seconded and carried that this report be received.

This was followed by the reading of a paper by Dr. A. Schlesinger, Jr., entitled "A Lazy Horse," the subject being a young animal devoid of energy, which proved to be due to extensive infection of intestinal parasites.

Following Dr. Schlesinger's paper, Dr. J. F. DeVine presented a chart giving in detail the results of tuberculin test of 2,001 animals and the post-mortem findings, explaining that the statistics were compiled to determine, if possible, the relation between temperature readings and post-mortem findings. The compilation pointed out that most generalized cases were animals carrying temperatures between 104 and 106 but with not enough regularity to be of any guiding value. This paper was discussed by Drs. Berns and Morris.

Dr. E. S. Sunderlin then presented a very interesting paper on the "Location of the Upper Lymphatic Glands and Ducts in the Calf."

The next paper was that of Dr. H. J. Milks, subject, "Vaccination Against Hog Cholera." This paper was discussed by Drs. Simpson, Hollingworth, Law and Moore. The discussion brought out clearly the necessity of diagnosis between hog cholera and poison resulting from feeding of garbage. Dr. Law pointed out that this poisoning by garbage was usually confined to a particular herd. Dr. Moore discussed the question of serum therapy, and thought there was an opening here in which a great deal of good might be accomplished, and it was well for veterinarians to familiarize themselves with the question of hog cholera vaccination.

The secretary then read the names of those proposed for membership. In the absence of some of the members of the Board of Censors the chair appointed Drs. Ackerman and Morris. The meeting here adjourned to go into executive session.

Pursuant to adjournment the meeting reconvened at 2.15 p. m. The minutes of the last meeting were then read and it was regularly moved, seconded and carried that they be accepted as read. The chairman of the Board of Censors then reported that they

had carefully examined all applications and desired to report favorably upon the following gentlemen: Jas. S. Ellicott, Harry B. Risley, John McCartney, Chas. Jamison, C. D. Pearce, Chas. S. Chase, Albert E. Merry, W. L. Gilbert, Walter D. Bennett, D. H. Udall, F. E. McClelland, Moffitt Smith, J. B. Knapp, A. B. Kelly, P. V. Weaver, G. P. Jeffery, Jos. G. Hill, Wm. H. Salisbury and Wm. H. Mahoney.

Motion regularly made and seconded that the secretary cast a ballot for the election of the gentlemen whose names were reported favorably by the Board of Censors.

Under miscellaneous business Dr. Henry Cady read a resolution in regard to the prosecution of illegal practitioners. Dr. Baker moved that the secretary be instructed to begin prosecution of illegal practitioners in the name of the society. This motion was withdrawn after some discussion. Dr. Ackerman moved that the society designate Mr. E. G. Scribner and that he be authorized to bring action on behalf of the society. Motion carried. * * *

Following some resolutions by the Committee on By-Laws, and the reading of the report of the Executive Committee, a paper was read by Dr. J. A. McCrank entitled "My Experience with Choking Animals." The subject seemed to be of particular interest and was quite lengthily discussed by Drs. Williams, Baker and Law; all agreeing that it was usually dangerous procedure to attempt to drench for the relief of this condition as the fluid is quite apt to return and pass down the trachea. Dr. Law pointed out an interesting fact learned from observation, that where an obstruction was close to the cardia bloating did not take place.

The next paper entitled "Verminous Embolism of the Cæcal Arteries," was read by Dr. I. L. Buchanan. After a discussion of this paper by several of the members the meeting was adjourned to reconvene again at the New Ithaca Hotel. The meeting was called to order at 8.30 p. m. in the dining room of the New Ithaca Hotel. Election of officers was then in order and resulted as follows:

President, Dr. E. B. Ackerman; vice-president, Dr. John F. DeVine; secretary-treasurer, Dr. H. J. Milks.

Election of Board of Censors resulted as follows: Drs. Switzer, Stone, Berns, Morrow and Cady.

Selection of place for next meeting was then in order, the following places extending an invitation: Niagara Falls, Ithaca

and Brooklyn. After a pleasant and friendly discussion it was put to a vote and resulted in Brooklyn being selected as the next place of meeting.

Dr. Moore read a very instructive and interesting paper on "Meat Inspection." Owing to the lateness of the hour and the volume of detail business to be finished it was deemed best to make the discussion as brief as possible. Report of the Committee on Resolutions followed.

Third Day—Meeting called to order by President Hollingsworth.

The Committee on Resolutions presented a resolution on meat inspection. Regularly moved and seconded that the resolution be adopted. Motion carried.

Dr. Curry made the motion to reopen the case of Dr. Cady. Motion seconded by Dr. Morrow. Carried.

Regularly moved, seconded and carried that the following resolution be adopted:

"Further resolved, That Dr. J. F. DeVine be and hereby is authorized, empowered and directed to institute such action and to perform every act necessary so to do, including the accumulation of evidence, employment of an attorney and the signing of all papers necessary for the prosecution of such action."

Meeting adjourned to the operating room, where the following interesting cases were witnessed:

Bay gelding: Neuroma of the median nerve. No operation.

Black mule foal: Scrotal hernia; covered operation under chloroform anaesthesia. F. F. Fehr, operator.

Bay mare: Recovered fracture of the metatarsus.

Brown gelding Peri-anal fistula.

Bulldog: Entropium; superior and inferior. H. M. C. anaesthesia. Dr. R. C. Reed, operator.

Black gelding: Roaring operation. J. N. Frost.

Bay mare: Spaying; vulva showed granular inflammation so that operation was considered inadvisable.

Bay gelding: Extreme volar flexion of the anterior fetlock.

Tenotomy, by Dr. W. L. Williams, without overcoming flexion.

Owing to the fact that many of the members had planned to attend the national meeting, the list of ladies in attendance at this meeting was fewer than usual, but those that did come re-

ceived the same hospitable consideration and attention as has always been characteristic of the wives and daughters of the members of the faculty.

J. F. DEVINE, Secretary.

ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION.

The twenty-seventh annual meeting of this association was called to order at Springfield, July 12-13, 1910, at 10 A. M., with President Glendenning in the chair. The minutes of the previous meeting were read, and on motion were approved.

ADMISSION OF NEW MEMBERS.

Dr. Alverson was appointed to fill a vacancy in the board of censors, pro tem; eight petitions for membership were read and were O. K.'d by the board of censors; it was moved and seconded that the secretary be instructed to cast the vote of the association, and the applicants were elected to membership.

PROGRAM.

Demonstration in securing hog cholera virus. At this point Dr. A. T. Peters gave a short explanation of the progress that has been made in this direction. The hog was then secured and with Drs. Niles and Juckiness, was bled; a post mortem was then held on the carcass, which weighed forty-five pounds, and four hundred and fifty-five ounces of blood was secured, and short explanations of the post-mortem lesions and many questions were answered relative to the subject.

Adjourned for lunch until 2 P. M.

A splendid lunch was prepared by the ladies of Springfield, and was enjoyed by 150 veterinarians and visitors. The Honorable Charles H. Deneen also participated in the festivities.

Mr. Phil. H. Hanner introduced the Governor, who gave an interesting talk and demonstrated his faith in the State Board of Live Stock Commissioners, the State Veterinarian, Dr. Peters, the director of the biological laboratory, and it was patent to all that he was a close observer of the veterinary profession and had faith in it.

THE GOVERNOR'S ADDRESS.

" Prior to the enactment by the Forty-fifth General Assembly of legislation conferring upon the Board of Live Stock Commissioners jurisdiction over the disposition of animals affected with disease, there was no legislation upon our statute books empowering the Commission to take any steps for the protection of the public health. This legislation, therefore, was a new departure and has naturally resulted in increasing the work of the Commission. One of the most important branches of its work now is that which is done in combating bovine tuberculosis. A prime requisite for the successful carrying on of this work is a plentiful supply of pure vaccine for the use of the Commission in making its tests; and this is what makes so important the erection of this great laboratory."

The construction of this laboratory is another step forward in the protective work of the Live Stock Commission. It was chiefly through the presentation of the matter to the General Assembly by the Commission that the enactment of the law appropriating money for its erection was brought about. It will be undoubtedly of great service in improving the work of the Commission in the fight against tuberculosis and hog cholera. Through its control of its laboratory, the Commission will be enabled to manufacture its own biological products, and thus be able to determine the quality of the vaccines to be used in its tests. This is very important, for in this way not only will the work of the Board itself be strengthened, but it will be able to furnish the live stock men throughout the state thoroughly reliable material for private tests. I understand that at present the branch for the manufacture of hog cholera vaccine only is in operation, but that within a short time the Commission hopes to have a number of other biological products ready for distribution. This will undoubtedly lead to a great lessening of the losses resulting from diseases of live stock and will encourage the growth and increase the prosperity of the industry by reducing these losses to the minimum. The encouragement of the live stock industry would be of great service also to the farming industry generally through its indirect effect in keeping up the fertility of the soil.

During the discussion in the General Assembly of the legislation under which this laboratory was erected, a question arose as to whether or not it should be connected with the State Uni-

versity, and the argument was presented by the Board of Live Stock Commissioners that the laboratory should be under its sole control, because the law had confided to the Board sole charge of the policing and protection of the live stock industry in the state. It was urged by the Commission that as the law had consigned to them the duty of devising ways and means for the protection of owners of live stock against preventable losses by disease, they should have full control of the manufacture of the vaccine which was one of the principal agents used in carrying on the work. As the vaccines manufactured in this laboratory are to be used by the agents of the Board in making their tests, it is, I think, well that the Commission has control of its production.

It should be the ambition of the Commission to make this laboratory one of the best of its kind in the country for careful scientific research. This can only be done by a strict adherence to high and approved standards in carrying on the work of investigation and research and by being satisfied with the attainment of nothing less than the best procurable results. I understand that it is the intention of the Commission to publish in its annual reports the results of the tests and experiments conducted here. This should prove a valuable addition to the official scientific literature of this important subject. Two reports are, I am told, to be issued; one in popular, the other in scientific, form.

It is with pleasure that I have learned of the very high class of work that the State Veterinarian has been carrying on throughout the state. His addresses at Chataqua and at farmer's institutes upon topics relating to veterinary surgery and the care of live stock, have not only been of great interest to his professional associates, but of great practical value to farmers and owners of live stock as showing the best methods of taking care of animals. The State Veterinarian, also, was one of the most assiduous workers for the laboratory, and is to be cordially commended for the part he has taken in procuring its erection.

This is an occasion which is naturally of the widest interest to live stock men throughout the state, and during your stay here I trust you will find occasion to discuss such live stock questions as are needing investigation and arrive at some concensus of opinion as to their solution which may be of value to the Live Stock Commission in its future work and furnish guidance to the General Assembly in connection with any needed legislation."

A group picture was then taken by the official photographer.

Mr. Nicholas Roberts, secretary of the Commercial Club, was introduced, and gave the members of the association a hearty welcome.

Dr. Green, Chairman of the State Board of Control of Charitable Institutions, was introduced and very briefly commented on the scientific investigation along the line of preventable diseases.

Professor Blair, State Superintendent of Schools, commented on the relation of the school children and the meat question, and stated that it depended largely on what a child ate, as to how he was enabled to think and act.

Mr. McCullough, State Auditor, was then called on and was much pleased with what he had seen and heard, and thanked the association for the opportunity of being present.

Judge Humphrey, was then called upon and spoke of the veterinarian and the live stock interests, and stated that veterinarians were being recognized as learned scientific men, closely related to the commercial interests in the state.

Dr. Niles spoke of the progress the different states were making in the control of hog cholera, and said the time was not far distant when that would be practically eliminated.

The different methods of vaccination were then taken up, and explained by Dr. Peters, and were afterwards demonstrated on the live subject, and a number of the members assisted in the injecting.

There was also a demonstration of the method of making the hog cholera serum ready for market. A conference of the day's work was then held; this consisted of questions on the different subjects of the day's work, and a general experience meeting; a number of the members telling of their experience with the serum, and commenting on the same; all seemed to be very much pleased with the results. Meeting then adjourned to meet the following morning at 9 A. M.

July 13.—Meeting reconvened: Reviewing a tuberculin chart and a physical examination of the animals. A great deal of interest was displayed in this subject, and the cattle were examined and subjected to all the known tests. The cattle were then slaughtered and post mortems held; the different tubercular lesions were demonstrated by Dr. Mattitall, Chief of B. A. I. staff of the National Stock Yards at St. Louis, and Dr. Paul Juckiness, State Veterinarian of Nebraska; a general play of

questions and answers took place in which most of those present took part. Adjourned for lunch to reconvene at 1.30 P. M.

Dr. A. T. Peters presented a case of sterility in a cow; he gave a very interesting talk of the causes and symptoms and method of operation, and stated that this was frequently caused by abortion; the two diseases must necessarily be considered together.

A free discussion was had on the different methods of cure and control.

This closed the practical part of the program.

Mr. Haner, Chairman of the State Board of Live Stock Commissioners, was introduced and expressed his satisfaction at the interest taken, the large number of veterinarians present, and the progress they were making in conserving the livestock interests, and hoped that every member would do all that was possible to assist the board in its efforts to make and build up a biological laboratory that the veterinarians would be proud of, and hoped they would interest their congressmen so that they could get a larger appropriation to work with.

Dr. James Wright, State Veterinarian, spoke on the general conditions of live stock matters in the state, and deplored the fact that it seemed impossible to get laws to protect the livestock interests of the state and to prevent the shipping into the state diseased cattle from other states, and advised all veterinarians to get their representatives to pledge themselves to support measures that would remedy the present existing conditions.

A resolution was presented by Drs. Martin, Nattress and Stringer thanking the State Board of Live Stock Commissioners for their entertainment and the bountiful luncheon they had provided. Also to Drs. Mattitall and Juckiness for their assistance; Dr. Peters for the thorough manner in which the program was carried through, and the able demonstrations he presented; also to Dr. Niles for his valuable assistance; also to the ladies of Springfield for their kind hospitality.

On motion, the resolutions were adopted.

The following were read and, on motion, were allowed:

Printing, \$3,225; stamps, mailing, express, etc., \$14.10; secretary's salary, \$25.

The following delegates were then selected to represent the Association at the A. V. M. A. meeting in September: Dr. Joseph Hughes, Dr. L. A. Merillat and Dr. W. A. Martin.

On motion the by-laws were suspended and twelve petitions were presented for membership and the secretary was instructed to cast the ballot of the Association for their election. They were accordingly elected.

The president closed the session with a few remarks on the success of the meeting; and it was the unanimous opinion that it was the most successful meeting in the history of the Association.

The meeting was then adjourned subject to the call of the president.

J. H. CRAWFORD,
Secretary.

ONTARIO VETERINARY ASSOCIATION.

In accordance with a resolution passed at the last annual meeting held in December, 1909, this meeting was held on August 4, 1910. The meeting was held in the lecture room of the Ontario Veterinary College, Toronto. Dr. C. S. Brind, of Woodstock, the president of the association, in the chair.

The minutes of the previous meeting were read and confirmed.

The secretary-treasurer's and auditor's reports were received and adopted.

The treasurer's report showed three fines of \$25 each, having been received amounting to \$75. These fines were collected from men for infringements of the "Ontario Veterinary Act."

The president made a few remarks regretting the absence from the meeting of the late principal of the college, Dr. Andrew Smith, owing to illness, and called on Dr. E. A. A. Grange, principal of the Ontario Veterinary College, to address the meeting.

Dr. Grange on rising made a few introductory remarks as to the profession in general. He spoke of the honor recently conferred on Dr. J. G. Rutherford, Veterinary Director General, by his Majesty the King, and said that both from the standpoint of our association, as well as our profession, he would advise that a committee be formed to pass a resolution of congratulation to Dr. Rutherford. In his remarks he referred to the Ontario Veterinary College, its course and examinations. The closing exercises were held at the university. The meeting was addressed by President Falconer, whose address was highly appreciated. The examinations held by the Department of Agriculture (Health of Animals Branch), also the state and provincial examinations of

graduates of the Ontario Veterinary College were very highly spoken of. He remarked on the unfairness of the report of the United States government in relation to the Ontario Veterinary College, and advised members of our association to read some articles written and published by Dr. J. P. Foster, State Veterinarian of Huron, S. Dakota, a graduate of said college.

Dr. J. G. Rutherford, Veterinary Director General, on rising to give a report on the recent outbreak of rabies in Ontario, as requested, said he had received a large number of letters and petitions on the cruelty of "muzzling the dog." He advised the reading of his pamphlet published on rabies, also the reading of recent reliable authorities on the disease. He made some general remarks on the outbreaks of the disease in this province, and its frequency, and gave statistics.

In the year 1907 eighteen premises were quarantined in the counties of Lincoln and Welland. In 1908 forty-two premises were quarantined in Welland, Haldimand, Brant and Oxford. In 1909, 146 cases in Brant, Wentworth, Oxford and Waterloo.

In 1910, in January, 41 cases were reported; February, 74; March, 63; April, 31; May, 30; June, 31; July, 5. Total number of animals lost exclusive of dogs and cats, from May, 1907, to July, 1910, was 5 horses, 84 cattle, 26 sheep and 33 swine. He remarked strongly regarding the necessity of dealing rigorously with the disease, and owing to the action of the government, this financial loss in animals cannot be considered excessive.

He received many letters from parties wishing to remove dogs from one place to another in quarantined districts. But we must consider the danger of the disease getting into the wild animals.

Considerable discussion ensued. It was believed that this last outbreak of the disease was brought into this province by a dog from the United States. Why not quarantine from the United States? Dr. Rutherford explained the difficulties in doing so. He could not see his way clear to establish a quarantine between this country and the United States.

An animated discussion then took place in connection with the Bacteriological Department. One hundred and seventy-four heads of dogs had been sent there for examination for rabies. Dr. Rutherford said he had cast no reflection whatever on that department.

At the kind invitation of Dr. Grange, the meeting adjourned for luncheon.

Meeting reopened after luncheon at 2.15 p. m.

The following motion was brought forward: "The association was much interested in the explanations on rabies given by Dr. Rutherford, Veterinary Director General, and strongly approves of the action of the government, which has been called the "muzzling orders" and other methods, adopted for the prevention of its spread." On motion of Dr. E. A. A. Grange this was carried by a rising vote.

Dr. Jas. A. Campbell read a good paper on "Rabies: Its Cause and Mode of Infection, Its Symptoms, Post-mortem Conditions That May be Found, and the Pasteur Treatment for a Person Bitten by a Dog Supposed to be Rabid." The subject of better legal protection for our profession was then brought forward. Dr. Cowan insisted that this association should demand from the government that a bill be passed for the better protection of our profession.

Dr. Mole read a letter from the Hon. Mr. Duff, in which he stated that opposition to the bill was so great that it was advisable to drop it, at least for this session.

After some discussion, in which several took part, Dr. Grange said that he did not think it necessary to call a meeting of the association for the purpose of pushing onward this matter at the present time; but that if thought advisable, the Legislative Committee could do so, as from his knowledge the government had not dropped the required legislation.

It was ultimately moved, seconded and carried, that "the Legislative Committee now in existence be authorized to hold office, and if thought necessary, call a special meeting of the association."

It was moved by Dr. Duncombe, seconded by Dr. Elliott and carried, "that the present officers of the association continue in office until the next annual meeting."

Moved by Dr. Tennant, seconded by Dr. Mole, and carried, "that the secretary be instructed to send a letter to Dr. A. Smith expressing our sorrow for his sickness and his inability to attend this meeting."

It was moved by Dr. Grange, seconded by Dr. Cowan, and carried, "that a committee of three be appointed to draft a resolution of congratulation to Dr. Rutherford, Veterinary Director General, on the honor recently conferred on him by His Majesty King George the Fifth." This was carried by a rising vote.

Dr. Grange, Dr. Cowan and Dr. Elliott were the committee appointed.

Dr. Mole read an interesting paper on "Intestinal Diseases," and the meeting adjourned.

C. HEATH SWEETAPPLE, V. S., Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The first yearly meeting of the Keystone Veterinary Medical Association was held on the evening of October 11, 1910, at Donaldson Hall, Philadelphia, Pa. Fifteen members responded to the roll and there were about thirty visitors present. Two new members were admitted to the association.

The election of officers took place and resulted as follows: President, Dr. J. Reichel, Philadelphia, Pa.; Vice-president, Dr. J. Vansant, Fox Chase, Pa.; Secretary-Treasurer, Dr. E. H. Yunker, Philadelphia, Pa. Board of Censors—Drs. W. H. Hoskins, C. J. Marshall, T. Kelly, H. C. Campbell and A. W. Ormeston.

The program for the evening comprised an address by Drs. W. H. Hoskins and C. J. Marshall upon their trip to the A. V. M. A. meeting, and the progress of the veterinary profession in the West.

A paper was presented entitled "The Examination of the Fæces of Forty Cattle for Tubercl Bacilli and Conclusions," by Drs. J. Reichel and E. S. Deubler. After an interesting discussion on the above paper the meeting was adjourned.

ELKAN H. YUNKER, Secretary.

DR. J. F. DE VINE, Goshen, N. Y., will address the members of the Veterinary Medical Association of New York City on the evening of November 2.

DR. J. C. NORTON of Phoenix, Arizona, says: "I cannot do business without the REVIEW. I always put it in my grip when I go off on railroad trips and read it thoroughly instead of train literature."

NEWS AND ITEMS.

VETERINARIAN

EXAMINATION Nov. 23, 1910.

The United States Civil Service Commission announces an examination on November 23, 1910, at the places mentioned in the list printed hereon, to secure eligibles from which to make certification to fill two vacancies in the position of veterinarian in the Quartermaster's Department, at \$1,200 per annum, one at Honolulu, Hawaii, and the other at San Juan, Porto Rico, and vacancies requiring similar qualifications as they may occur in any branch of the service, including the Philippine service, in which the entrance salary is \$1,600 per annum, unless it shall be decided in the interest of the service to fill either or both of the specific vacancies mentioned by reinstatement, transfer, or promotion.

The examination will consist of the subjects mentioned below, weighted as indicated:

Subjects.	Weights.
1. Letter writing.....	10
2. Veterinary anatomy and physiology.....	20
3. Veterinary pathology.....	20
4. Veterinary practice.....	40
5. Training and experience.....	10
Total	100

Applicants must show that they are graduates of reputable veterinary colleges.

Age limits for the Federal service, 20 years or over on the date of the examination. For the Philippine service, applicants must have reached their eighteenth birthday, but not their fortieth birthday, on the date of the examination.

Appointees in the Philippine service are allowed field expenses when absent on duty from their permanent stations.

Examination Form 1312 is required for the Federal service.

Examination Forms 2 and 375 are required for the Philippine service.

The medical certificate in Form 2 for the Philippine service must be filled in by some medical officer in the service of the United States. Applicants should appear before medical officers of the Army, Navy, Indian, or Public Health and Marine Hospital Service. If such an officer can not be conveniently visited, a pension-examining surgeon may execute the certificate. Special arrangements have been made with pension-examining boards throughout the country to give such examination for a fee of \$2, to be paid by the applicant. This certificate must not be executed by the family physician of the applicant. The medical officer should indicate his rank or official designation on such certificate.

Each applicant for the Philippine service will be required to submit to the examiner on the day of examination a photograph of himself, taken within three years, which will be filed with his examination papers as a means of identification in case he receives appointment. An unmounted photograph is preferred. The name, date and place of examination, the examination number, and the competitor's name, and the year in which the photograph was taken should be indicated on the photograph.

Applicants may be examined for both services upon filing the proper forms.

This examination is open to all citizens of the United States who comply with the requirements.

This announcement contains all information which is communicated to applicants regarding the scope of the examination, the vacancy or vacancies to be filled, and the qualifications required.

Applicants should at once apply to the United States Civil Service Commission, Washington, D. C. * * *. No application will be accepted unless properly executed and filed with the Commission at Washington. In applying for this examination the exact title as given at the head of this announcement should be used in the application.

As examination papers are shipped direct from the Commission to the places of examination, it is necessary that applications be received in ample time to arrange for the examination desired at the place indicated by the applicant. The Commission will, therefore, arrange to examine any applicant whose application is received in time to permit the shipment of the necessary papers.

Issued October 20, 1910.

AMERICAN VETERINARY REVIEW.

DECEMBER, 1910.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, October 15, 1910.

SURGICAL TREATMENT OF ROARING.—Since our good friend and esteemed collaborator, Prof. W. L. Williams, has made a visit to England on his way to "The Hague" Congress, the question of what is the best method to follow to relieve roaring has been agitated, principally in England, where we hear that Prof. Hobday has performed Williams' operation and has improved it in numerous instances. The celebrated veteran of French veterinary surgery, Prof. Cadiot, has come out after a ten years' silence on the subject, and in one of the numbers of the *Recueil*, that of July 15th, there is published a magistral lecture that he delivered to his students on the subjects of Arytenoidectomy and Arytenoidopexy, in which he passed a review on the subject, referring to the successes obtained and recorded with Arytenoidectomy, by such men as Moeller, Siedamgrotzky, Lancilloti, Lebel, Plotz, Vennerholen, Bang, Sand, Hendricks, and many others; he concludes that the proof is well established, but nevertheless unsuccessful attempts must not be ignored. Prof. Cadiot then reviews other various methods and states that arytenoidectomy has been completed by the removal of the internal wall of the laryngeal ventricle, which has the advantage of increasing the laryngeal canal in all its height. He said a

word only of the attempts that were made of suturing the recurrent nerve to the pneumogastric, and arrived at the consideration of arytenoidopexy alluding to the method of Merillat.

The method of Prof. Williams was also carefully examined, the modus operandi described, and the advantages that it seems to possess dwelt upon. The results, so far, he says, are not positive; but if they confirm the facts that are already related, if they prove the efficacy of arytenoidopexy, it will certainly be a wonderful progress, which will deserve the preference when compared with arytenoidectomy, as it will be the less offensive interference.

It is well indeed for Prof. Cadiot to hold such an opinion. Advocate of an operation which has given such great results, proved so successful in many instances, he does not hesitate to acknowledge the superiority of another method, if proved by experience. In the meanwhile, he is working, he is operating and it is certain that one day, possibly far away as time only will tell the permanent efficacy of the operation, then we will have *statistics* which will decide the question beyond the possibility of doubt. I am following the tests and will be glad to present them to our readers when they are ready for publication. But we must not forget that Prof. Hobday is also hard at work. The cases that he and his assistants have operated are already counted by hundreds. But an indiscreet rumor has reached me. Prof. Hobday has had the idea of adding something to Williams' operation. If the removal of the lining of one of the laryngeal ventricles may result in enlarging the diameter of the larynx and immobilize the arytenoid cartilage, by the cicatrization, why not remove the lining of both ventricles?

If I am not mistaken that is what he is doing now; with what results time will tell. I think Cadiot has tried it also before this.



The *Veterinary Record* of September 17th has from the pen of J. J. O'Connor, M.R.C.V.S., an article on a new method of

operating for roaring that I would do an injustice to if I did not relate it in this chronicle. Here is the modus operandi:

"Proceed as usual until the thyroid cartilage is reached, have the divided muscles retracted with retractors, push portion of the crico-thyroid muscle aside with the handle of the bistoury. In the angle between the anterior and inferior borders (taking the neck to be vertical) of the thyroid wing, remove by means of a trephine one-half inch in diameter, a disc of cartilage, thus exposing the thyro-arytenoid muscle immediately to the inside of the vocal cord, with the mucous membrane of the ventricle protruding between the two bellies of the muscle. Grasp the mucous membrane with a forceps, and by means of the handle of the bistoury, isolate it as far as possible from the surrounding tissues. Incise it anteriorly immediately behind the cartilage in the aryteno-epiglottic fold of membrane, thus opening into the larynx, and continue the incision all round the periphery of the exposed piece of membrane and thereby remove the greater part of the ventricular lining, including that towards the inner aspect of the vocal cord. A small portion of the membrane still lines the anterior portion of the ventricle. This can be easily grasped with the forceps, drawn through the trephine opening, cut at its fixed border and removed."

The advantages that Mr. O'Connor claims for this method are: 1. The ventricle is more directly reached; 2. There is no speculum or dilator required to be inserted into the larynx and possibly injure its lining; 3. There is no danger of wounding the interior of the larynx with the knife or other instrument in the hands of an inexperienced or nervous operator or in the case of a sudden movement of the animal should he not be profoundly anesthetized; 4. The wounds of the laryngeal opening and snipping of the ventricle are practically one and the same; 5. The cicatrization of the internal wound must necessarily draw the vocal cords outwards and thus the desired effect; 6. The thyro-arytenoid muscle always coming into view, it can at once be seen whether it has undergone atrophy and whether the case is one of true roaring; 7. The operation performed practically outside the

larynx and there is less danger of inspiration of foreign material through the laryngeal opening afterwards, being protected by the sterno-thyro-hyoid muscle which partly covers it.

In the presence of so many apparent advantages, Mr. O'Connor recognizes as apparent disadvantages: 1. The possibility of excessive granulations forming round the edges of the opening of the cartilage. But there seems to be no reason why this should occur then any more than in a temporary tracheotomy opening or that of a sinus of the head. 2. The escape of blood from the larynx may not be so free as in the case of the crico-thyroid opening.

Mr. O'Connor has operated *only* one living horse by this method and hopes that other members of the profession may express their views regarding it. The Profession has the floor.

* * *

MALTA FEVER.—I have already alluded to this microbian disease which affects goats in some parts of the world, principally the Island of Malta and the coasts of the Mediterranean sea; and in a previous chronicle I suggested to those desirous of information relating to it, to refer to the report of 1908 of the Bureau of Animal Industry where the question of the importation of Maltese goats in the United States was justly condemned in the sixth conclusion of the excellent report of Dr. J. H. Mohler and George H. Hart, which read: "So long as Malta fever remains so prevalent in the Island of Malta and such a large percentage of the native goats are passive carriers of the *Micrococcus Melitensis*, it will be impracticable to attempt to introduce these animals into the United States. Even if they were assuredly free from the *Micrococcus Melitensis* it is doubtful on account of climatic conditions, whether they could be profitably bred in this country, except in the extreme southern states."

The reading of two recent articles in the *Revue Veterinaire* brings out points of interest in relation to the presence of the disease in other animals than goats and to the possible contagion

from these to men. They relate two cases of the disease transmitted to men by sheep and from sheep to fowls.

Indeed if some authors have already mentioned the possibility of a natural infection of bovines by the *M. Melitensis* and of the danger to which men could be exposed by it, no cases of Malta fever in man of bovine origin has yet been positively demonstrated. Mr. Dubois, late adjunct professor to the Toulouse school, has had the opportunity to witness several cases in human beings, which were undoubtedly due to infection from diseased sheep; a positive sero-diagnosis with the *M. Melitensis* and exclusive evidences of any other mode of contamination having been obtained by agglutination. In one place where the disease prevailed among ewes, ten persons, and in another thirteen presented undoubted symptoms of Malta fever. They had consumed milk and cheese from the diseased sheep, or had been only merely in contact with diseased animals (milking or other care). The *Micrococcus* was revealed as present in the blood of some of the sick persons which gave a positive sero-diagnosis of agglutination.

Investigating a very fatal epizooty among fowls, one in which the mortality had been of 70 per cent. out of a flock of 205 head, and having affected birds of all ages and assuming either a somewhat sub-acute form lasting eight or ten days and again one which ended very rapidly by death in a few hours, Mr. Dubois found in studying the nature of the epizooty among the fowls that all attempts to obtain cultures with the liver, spleen and blood from the heart of the fowls were negative as well as inoculations to rabbits, guinea pigs and pigeons. But by resorting to the sero-reaction method of diagnosis he succeeded in obtaining a complete manifest agglutination, and as in the locality where the epizooty existed, there were ewes in which Malta fever prevailed more or less extensively, he was justified to admit that the disease was due to infection by *M. Melitensis* and that this domestic animal, the fowl, may also be a source of infection to man.

The place of Malta fever among the diseases against which sanitary measures are indicated is again well demonstrated by the cases related above.

* * *

CYSTOPEXY IN DOGS.—Taken from human surgery this operation is described by adjunct Professor, Mr. L. Auger, of Lyon, as the choice treatment in cases of retroflexion of the bladder, not infrequently met in dogs where it gives rise to pseudo-perineal hernia manifestations.

This accident observed principally in male subjects is indeed characterized by the change of position of the bladder which has, by a flexion at its neck, bent itself upwards and backwards to become located under the skin of the perineum between the rectum above and the urethra and prostate below. In this position micturition is interfered with, the urine flowing in by the ureters gathers in the cavity of the bladder, which soon becomes more and more distended. As the distension takes place, the flexion of the neck becomes more severe and the time soon comes when urination is impossible and rupture of the bladder is imminent unless quick relief is given.

Generally when the veterinarian is called to attend to one of these cases, the accident has already existed two or three days, and the bladder is more or less distended. It is then that the manifestations are those of a large perineal hernia. Under the anus there is an enormous swelling, more or less stretched, fluctuating, not very painful on pressure. It is the displaced bladder. In cases where the organ is very full, the anus is pushed on one side, and the rectum is squeezed between the bladder and the pelvis. To the impossibility of micturition is added that of defecation. The diagnosis of this affection is easy to make. An exploring puncture will settle the question.

The treatment must be applied at once, viz: replace the bladder and hold it in its normal position. If by taxis, the first indication can be fulfilled easily; it is not the same for the second, and on that account the only efficacious interference is first to

put back the bladder directly and after fix it by cystopexy or suturing it to the abdominal walls.

After having first of all emptied the bladder with fine exploring trocar, and also the rectum by enemas, the various steps of laparotomy are performed, the abdomen open, the bladder is carefully pulled from its abnormal position, placed where it ought to be, and with very fine needle and silk it is sutured to the walls of the abdominal cavity. The operation is simple, but, however, it is important not to involve in the stitches the vesicle mucous membrane. They must pass only through the serous and muscular coats. The after results are insignificant, as micturition and defecation are soon again normally performed.

In his article Mr. Auger mentions three cases where he performed the operation. In two it was a perfect success with perfect recovery, the accident never returned. In the third case death took place by peritonitis, the animal having torn his dressing three days after the operation.

I do not know if others have already tried this mode of treatment, but certainly its introduction in canine surgery is an important step, which will no doubt be followed by others.



SULPHATE OF HORDENINE.—Therapeutics has received lately a new alkaloid which is called to play an important part in gastrointestinal diseases, enteritis and dysentery; at least so says the *Presse Medicale*.

The history of its discovery is quite interesting. The residues of the radicles of malt or of germinating barley seeds, used to make beer, are employed for many purposes, and among those stands the preparation of bouillons for media of cultures in laboratories. In 1890 G. Roux observed that vibrios of cholera not only did not grow in such culture, but that they were destroyed, and from that he concluded that "such residue might serve in the treatment of various diarrhoeas, either in drinks or in enemas." This idea was studied by others and the conclusions

were that in those residues there existed an active principle, to which these therapeutic properties were due. A chemist, indeed, a few years later, in 1906, succeeded in isolating an alkaloid, the *Hordenine*, whose characters, composition and physico-chemical composition were soon made known. The physiological and the clinco-therapeutic were carried out, and to-day the results obtained are well known.

Hordenine is an alkaloid that can combine with salts and the sulphate among them is the one which seems to possess the qualities essential to permit its being used hypodermically or by the digestive tract. Its toxicity is very weak, its minima fatal dose in intravenous injections is 0 gram, 25 by kilogramme weight of the animal, for dogs, guinea pigs or rabbits.

Given in intravenous injection, it acts in therapeutic doses as a hypertensor cardio-vascular tonic. Its action upon the secretions varies according to doses and experimental conditions and on that account may be hyper or hypocrinic. In dogs, in doses of from 1 to 10 centigrammes by kilogramme, it produces nausea, vomiting and constipation by immobilization of the intestines.

To the clinical point of view, it has been extensively experimented with and proved very promising in the advantages that can be gained by its use. Its action has made it, for some, comparable to those of opium and of morphia. And although the toxicity of *Hordenine* is much less than that of morphia, the hypocrinic and inhibitric effect on the intestinal peristaltism is common to both as well as the toni-cardiac action. *Hordenine* acts upon the diarrhoeic elements, quiets the pain, immobilizes the intestines and sometimes promotes constipation.

We believe that in some pathological condition of the intestines of dogs, *Hordenine* may prove quite useful to veterinary practitioners.



STRONGYLUS DOUGLASSII OR WIRE WORMS IN THE OSTRICH.
—The learned Director of the Veterinary Laboratory of

Grahamstown, W. Robertson, M.R.C.V.S., writes a popular article on this parasite in the *Agricultural Journal of Cape of Good Hope*, where interesting points are found for ostrich breeders and veterinarians as well.

First noticed some thirty years ago by Hon Arthur Douglass, from whom the name was given, *Strongylus Douglassii* are fre-



DIAGRAM SHOWING THE POSITION OF THE FINGERS OF THE LEFT HAND COVERING THE WINDPIPE WHEN DRENCHING.

—From the "Agric. Journ., Cape Good Hope.

quent in South African birds and do a great deal of harm. As a general statement it may be said that all birds (ostriches) are infected with them and that in all degrees, although it is said that a bird under twenty days old has never been found badly infected, yet one month old chicks have been seen with their stomachs alive with the parasites.

The symptoms presented by the bird are briefly: General falling off in condition, a disappearance of the yellow sub-cutaneous fat (so noticeable in healthy well doing birds), a pallor of the pink lining of the mouth and throat, and sometimes an in-

crease in the amount of chalky deposits voided with the urine and dung. A curious feature of a bird affected is its refusal to eat meales, dry barley, or other grain.

The number of parasites that may be found is simply enormous. Estimated approximately at several millions, it is probable that 5,000 is more the correct figure. By experiments carried out, it can be safely assumeed that the incubation period of the eggs of the *S. Douglassii* is between seventeen and twenty days. The treatments recommended are quite legion. Administered in drenches, carbolic acid does good for the worms, but it



HOLDING THE HEAD UP AFTER DRENCHING.

may also be the fruitful cause of injuring the feathers. Lysol has also its advocates. So has paraffine, blue stone, tar dip, formalin, lime and sal ammoniac.

The administration is comparatively a simple operation and yet it requires some attention. Tin bottles with an air hole is the best to use. Stand in front of the bird, keeping clear of the legs, have a boy to each wing and see that they grasp the root of the wing and the body well, as dislocation of the wing may re-

sult by improper holding; then seize the bird's lower jaw with the left hand, shove the first, second and third fingers over the opening of the wind pipe in the floor of the mouth, the thumb being under the lower jaw, slip the neck of the bottle over the fingers and well down the gullet, empty, and withdraw the bottle. Hold up the bird's head for a second or two as some of them have the power of inverting the beak and literally pour the medicine out. This information from Dr. Robertson is very interesting and useful and must be of great advantage to those who cannot secure veterinary service easily.



AN IMPROVEMENT IN CHLOROFORMIZATION.—In domestic animals and principally dogs and cats, chloroform is most used to obtain general anaesthesia, and although serious modifications, care and apparatuses of all kinds have been resorted to so as to render it harmless, the operation is not without danger; even notwithstanding the subcutaneous injection of atropomorphine, there is especially with operations having a long duration, more or less danger of accidents always undesirable.

To remedy this Mr. Charmoy, Chief of Clinics at Alfort, has resorted to a modification in the technic of general chloroformization which he has borrowed from German human surgery and which has given him excellent results.

Doctor Klapp, of the clinics of Bier at Berlin, had noticed that in animals recently bled, chloroform anaesthesia was more rapid than in those that had not been bled. This being due to the fact that there was less blood to saturate with the anaesthetic to produce sleep. From this remark he concluded that if he could with his patients take off some of their blood from the action of chloroform, by applying elastic strings at the base of both thighs, he might obtain the same results as on an animal just bled. This he did with success; and besides, he observed that at the end of the operation, when the elastic compression was removed, and the

circulation re-established, the patient would wake up almost immediately without any bad after ill effects. Fresh blood not intoxicated by the chloroform thrown in the circulation caused it. In cases of syncope this could no doubt give as excellent results also. Dr. Klapp has resorted to this method of chloroformization in many operations and always arrived at the same ends: *Easier and more rapid anaesthesia and more rapid waking up afterwards.* The learned Chief of Clinics at Alfort has tried the method in cats and dogs whenever important operations required general anaesthesia, employing or rejecting the previous injection of atropomorphine. Rubber cords were applied on the hind legs above the stifle and at the same time on the fore limbs above the elbows, tightening them well high up so as to immobilize as much blood as possible. They were tightened so as to arrest the arrival of the blood in the extremities. General anaesthesia was then proceeded with in the usual manner; it took place more rapidly and as soon as the operation was ended and the rubbers made loose and removed, gradually the animal opened his eyes, moved his head and came to without any trouble. Prof. Charmoy has performed nineteen operations of importance with this improved mode of general anaesthesia (hernias, colopexy, hysteropexy, ovariotomy, enterotomy, cataract, removal of tumors and extremities), and he had only two accidents. In one, the animal had extensive lesions of the liver and in the other severe tuberculous lesions.

As an experiment on one animal, the anaesthesia was carried out to complete arrest of respiration, death was about taking place, but life soon returned by degrees and almost suddenly with the removal of the elastic ligatures from the four legs. A far better result being obtained than that which could have followed the ordinary classic method of artificial respiration and so forth.

As a possible objection (if it is one) is that infrequently a certain loss of power on the legs may follow and last a few days. But this readily subsides without treatment and is all gone after a week or so.

This is a valuable addition to the administration of general anaesthesia in our small domestic animals, where, even with the closest attention, complications may arise.

* * *

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Bulletin of The Louisiana State Board of Health containing the proceedings of the Fifth Annual Health Conference, where among the many valuable contributions published is the illustrated one of Dr. Dalrymple of the State University on "Some Conditions Affecting Public Health."

Agricultural Journal of the Cape of Good Hope.

Veterinary Notes of Parke Davis and Co., September number of Vol. 3.

Report of the Investigations carried on at the Bacteriological Institute of Halle by our esteemed collaborator, Prof. Dr. H. Raebiger, and finally I have also just received the announcement of the New York State Veterinary College, with the report from the Director, Prof. V. A. Moore, and Pamphlet VI. from the Council on Defense of Medical Research.

And as I am closing this chronicle, there comes from Montevideo the eight first numbers of the *Revista de Medicina Veterinaria de la Escuela de Montevideo*, with our old friend, Dr. Daniel E. Salmon as Director. We send our thanks to the doctor and our welcome for the new Revue, whose success cannot be doubted with such eminent leader and its long list of worthy collaborators.

A. L.

A. V. M. A. TO GO TO TORONTO IN 1911.

As a result of the votes cast for each of the cities that extended invitations to the American Veterinary Medical Association to meet within their gates in 1911, Toronto, Canada, has been elected. And, since the votes electing Toronto have come from a representation of the association embracing the four points of the compass and the Middle West also, it is the unquestionable *choice* of the association, and we look forward to a tremendous gathering there at the next convention of the national organization. Many of our Canadian brethren have faithfully attended our meetings in the United States, wherever we have elected to hold them, but there are undoubtedly many hundreds of others who will avail themselves of this opportunity to meet with us on their own soil that would never have come to us here, even though on this, our second trip into their country, we do not penetrate any great distance into the interior. Through a strange coincidence the gentleman who will preside at the coming meeting of the American Veterinary Medical Association on Canadian soil was elected to membership in the organization on the one other occasion when it convened in Canada. Let us hope that this coincidence will afford President Glover *the* opportunity to realize his expressed ambition for a thousand new members for the A. V. M. A. in 1910-11. Supporting the ambition of the chief executive of the A. V. M. A., the REVIEW renews its appeal of a year ago, to each member of the association to secure one new member. That seems very little for each member to do, and really *is* very little; and yet if they will but do it, the glorious ambition will become an accomplished fact. Who will send in the first name? Among some of the other ambitions of the president, and toward which he will direct his earnest efforts, are the raising of the standard of matriculation requirements for entrance into the veterinary schools, and the securing of uniformity of degrees in all recognized veterinary colleges of America. These efforts should have the support not only of every member of the organization, but of every

veterinarian in America. The good that would result from their accomplishment is too obvious to require argument in their favor.

* * *

NATIONAL HORSE SHOW.

The most brilliant event on the social or sporting calendar of the season was brought to a close in Madison Square Garden, New York, at a late hour on Saturday night, November 19th, when the National Horse Show, which had opened there on the 12th, concluded its imposing program by awarding the prizes to the championship classes. This required practically the entire day, beginning with the light harness horses in the morning, following with the saddle classes in the afternoon and finishing with the high-stepping harness horses and hunters in the evening; although one large class of hunters or jumpers was shown in the afternoon that gave those present a splendid exhibition of training and finished jumping. They jumped into a small enclosure with a high fence on four sides, continuing on and out of it over the fence at the opposite end, turning and jumping back into it, and out of it over the *side* fence without stopping; then proceeded to a four-rail fence, where the rider was required to remove the top rail with one hand, while controlling his horse with the other, rode back a few yards, returned and jumped the remaining three rails. Splendid types indeed were the horses that executed with apparent ease that difficult feat. Another exhibition of good horsemanship and good horses was the police horse drill, in which twenty-nine mounted officers went through many brilliant manœuvres without a single mistake, their mounts being trained with military exactness.

Among many encouraging features of the 1910 show was the interest shown in the breeding classes, and in horses for practical everyday purposes, such as the roadsters and draft horses, as well as the hackneys and coachers, not alone by the exhibitors, who had entered generous classes of trotters and road-

sters, including two classes of Morgans, one for mares and one for stallions, but also by the genuine interest evinced by a large percentage of the eighty thousand visitors who came in during the week to "look them over." The selection by the judges of the Austrian-bred trotting stallion "Willy," 2.07 $\frac{3}{4}$, as the best horse of his type in the show, will no doubt be a great stimulus to the breeders of trotters and roadsters in America to present one next year to eclipse him.

Two such horse shows as have been conducted by the National Horse Show Association of America in New York in 1909 and 1910 are surely encouraging to the horse interests of the country, and we can look forward to a continuance of them, better on each succeeding occasion, under the efficient directorship of its officers. The veterinary representation attached to the judges' staff were Drs. J. E. Ryder, New York City; William Sheppard, Sheepshead Bay, N. Y., and E. R. Voorhees, Somerville, N. J.

THE following from the *Breeder's Gazette* of November 23 indicates that the horse is also the center of attraction in Chicago's society, and making a hit:

"Horse-lovers who have flocked to Chicago are enjoying the best horse show ever seen in the West, if not in America. The recent show ring experiences of some noted winners at last week's New York show have, if possible, improved their performance here. Every class is well filled and hotly contested by the horses, while the friendly rivalry of exhibitors prompts the keenest efforts to win. The show is a beautiful, entertaining and instructive presentation of the extreme quality of type and performance that has been attained by harness and saddle horses. The International of Chicago has undoubtedly gained strength since last year. The large showing of saddle horses and ponies in various classes is an especially gratifying evidence of the growing interest of American breeders in these useful pleasure types which must always be in demand. Interest in the classes for army officers is at high tension, both because of their distinctly international flavor and for the novel character of the events." * * *

ORIGINAL ARTICLES.

OPEN AIR EXPERIMENTS WITH TUBERCULOUS CATTLE.*

By J. G. RUTHERFORD, OTTAWA, CANADA.

In the year 1905 a herd of cattle on one of the outlying experimental farms situated in Nova Scotia were found, on being tested, to be badly affected with tuberculosis.

All clinical cases having been slaughtered, the survivors were at my request kept under open air conditions from December, 1905, until May, 1906, when they were removed to Ottawa and placed in a secluded pasture to which outside cattle had no access.

Here also they were kept under open air conditions, their only shelter being a frame shed one board thick, wind and weather proof above and on three sides, but on the fourth open to a large yard where they were fed in winter, but from which they were at liberty to wander at will. Except when undergoing test, they watered themselves at running streams on one of which a drinking place was always kept open in winter. The pasture, which consisted of some two hundred acres of rough land, abounded in natural shelter, the shed itself being situated in a grove of evergreen trees which afforded considerable protection from the keen winds of winter.

Their food consisted of grass in summer and in winter of good sound hay. A small grain ration was occasionally given for a short period to such of the older animals as appeared to require it, but these cases were very few, the majority keeping in good condition at all times, although naturally running down in flesh in the late summer and early fall, the seasons being

*Presented in connection with Report of Committee on Diseases, A. V. M. A., San Francisco, Cal., September, 1910.

through the whole experiment abnormally dry. Salt was kept constantly within reach.

On arrival at the station the herd numbered forty three (43) head, twenty-eight (28) being pronounced reactors. Of these latter twenty-one (21) were females of dairy blood, comprising pure bred and grade Ayrshires, Holsteins and Guernseys ranging in age from one to eleven years. One was a pure bred Ayrshire bull two years old, and the other six (6) were yearling steers, one being a Hereford grade and the others grade Shorthorns.

Of the non-reacting animals two (2) were yearling heifers of Ayrshire blood, seven (7) were yearling Shorthorn grade steers, and five (5) were calves of various dairy breeds.

The objects which I had in view in commencing the experiment, which was of a purely practical character, were three in number:

- (1) To ascertain the effects of the open air treatment on the diseased cattle themselves.
- (2) To ascertain to what extent healthy cattle kept in contact with diseased cattle were subject to infection.
- (3) To ascertain what percentage of healthy calves it is possible to rear without any precautions from diseased cows kept under open air conditions.

In the light of experience I am now convinced that in so far as the securing of definite information on these three points was concerned, this original herd should have been maintained intact and without additions throughout the whole course of the experiment.

As will be shown, however, this was not done and the results of the work are accordingly less exact and proportionately less valuable from the breeder's point of view, although possibly more interesting to the professional man than they otherwise would have been.

The alterations which took place in the herd were as follows: One two-year-old heifer (non-reactor) and one bull calf died of black quarter shortly after arrival at the station. An eight-year-

old cow (reactor) died of broncho-pneumonia after being mired in the creek for some time in freezing weather.

These losses as also some which occurred later among animals born on the station were, although regrettable, only such as might occur under any circumstances. I may say that after the occurrence of the black quarter cases, all the young stock was kept carefully vaccinated, and further, that no more cows got fast in the creek.

For the other changes, some of which I now think were mistakes, I assume full responsibility.

In July, 1906, some few weeks after their arrival at the station the six reacting steers already mentioned were slaughtered under supervision. They were fat, and as we had numerous reactors capable of breeding and therefore more valuable, I grudged the grass they were eating, and decided to let them go.

Of the six reacting steers the carcase of one only was condemned, tubercular lesions being found in the post-pharyngeal glands and in the bronchial and mediastinal glands, as also a large abscess containing several pints of semi-fluid foetid pus involving the liver and the right kidney.

Although tuberculosis was found in each of the four others, it was of the slightest character. The sixth was apparently free from disease.

We may let them go from this paper as they went from the experiment, as their history is of little value, except in so far as it corroborates very strikingly the theory that the incipient case of tuberculosis gives the highest reaction to tuberculin. They were only yearlings on arrival at the station, yet their highest temperatures, when tested the previous year in Nova Scotia were respectively, 107.6° , 106° , 106° , 108.2° , 106° , 105° .

In the fall of 1907 the seven steers which were rated as healthy on arrival, having been subsequently tested several times without reaction, were slaughtered, no evidence of tubercular infection being discovered in any of these.

These steers should undoubtedly have been kept in contact with the diseased cattle until the close of the experiment, but as

we had a number of other non-reactors, and these were of no value for breeding purposes, while the herd from natural increase and other additions numbered at this time over seventy-five (75) head, I was reluctantly compelled to let them go.

The outside animals added to the herd were of two kinds:

Owing to a lack of foresight on the part of those in charge of the cattle in Nova Scotia, during the latter part of the first winter the bull was permitted to run with the cows, most of which had not been bred during the previous season. As a natural result our calves began to arrive in November, most of them coming in December when the weather was intensely cold. Fearing that under open air conditions the loss would be considerable, I arranged for a supply of young calves from outside sources, and on such of the cows as were heavy milkers I put an extra calf. This also was an error from the point of view of exactitude in results, but although, as will be seen later, a greater percentage of these animals than of those born on the station, proved to be tubercular, I am not inclined to the belief that any of them were affected on arrival, as none of them were more than a few days old.

The other additions, however, comprised both diseased and healthy animals. Thirteen (13) mature reactors and one reacting yearling, mostly pure bred animals of the dairy breeds, were introduced from time to time, while four non-reacting yearlings were also added.

Seven of these outside reactors were on arrival well marked clinical cases, and as several subsequently broke down with what was evidently a most virulent form of the disease I am inclined to think that they were responsible for the infection of some of the young stock and possibly for the re-infection of a number of the older animals which had ceased to react and were apparently on the road to recovery.

Their introduction was therefore another mistake, but as from several of them we were able to derive valuable information we need spend no time in vain regrets.

In all 350 tests were made during the course of the experiments, 259 of which were on reactors and the remainder on animals which with one exception, No. 4-A, to which special reference will be made later, were so far as it was possible to judge, free from tuberculosis.

Of the 350 tests above mentioned, 161 were made in such a way as to ensure the detection of any abnormally early reaction, and it is interesting to note that although in 119 of these cases the animals tested were reactors and in twenty-one (21) the period between the tests was less than three months, there were only seven (7) instances in which it might have been possible to miss the highest reading by beginning to take post injection temperatures at the tenth hour as was the usual practice until the announcement made by Professor Vallée, a few years ago, led us to look for earlier reactions, especially in animals which had been previously tested within a short period.

As this is rather interesting, I will give the details of these cases as follows:

No.	Name.	No. of test.	Period since last test.	Date of test.	Distinct rise.	Highest temp.	Normal temp.
4	Sarah.....	7th	11 mos.	Sept., 1908	2d hr.	8th hr.	10th hr.
6	Mamie.....	4th	8 mos.	May, 1907	4th hr.	4th hr.	7th hr.
13	Polly.....	8th	3 mos.	Feb., 1909	6th hr.	8th hr.	20th hr.
15B	Lydia's calf (adopted).....	ad	11 mos.	Sept., 1908	2d hr.	2d hr.	8th hr.
18a	Bonnie Lass's heifer calf.....	ad	3½ mos.	Nov., 1907	4th hr.	8th hr.	10th hr.
30	Guernsey heifer.....	5th	11 mos.	Sept., 1908	4th hr.	8th hr.	16th hr.
68	Denty Girl.....	4th	11 mos.	Sept., 1908	2d hr.	8th hr.	10th hr.
86a	Illuminata 3d's calf	3d	3 mos.	Feb., 1909	2d hr.	24th hr.	26th hr.

It is noteworthy that none of these early reactions occurred in the twenty-one (21) cases in which the last previous test had been made less than three months before, and that, in fact, most of them occurred in animals which had not been tested for nearly a year.

The eighth test in this table (92-93 Illuminata 3d's calf) is only listed with the others as showing one of the eccentricities of temperature which may be encountered when using tuberculin.

Having now laid before you a general outline of the experiment I propose to run as rapidly as possible over its details, first dealing with each animal separately and concluding with a brief summary of the results obtained.

The information to be derived from these is perhaps of minor value being decidedly negative in character, but as we and some others much more distinguished have reason to know, it is not well to be at any time too positive in regard to bovine tuberculosis.

In order to economize your time and patience, I propose on this occasion to give only the results of each test and not the various temperatures. The tests were of various kinds. Those of May and October, 1905, September, 1906, July and October, 1907, and February 18th, 1909, were conducted in the ordinary way by injecting at night and commencing to take temperatures at or about the tenth hour thereafter.

On the other hand in that of May, 1907, the taking of temperatures was begun at the fourth hour after injection and continued every third hour until the seventeenth hour, while in those of September and November, 1908, the first temperature was taken two hours after injection, subsequent temperatures being taken every second hour until the twenty-fourth hour.

That of February 21st to 27th, 1909, was a special test in which only a few of the survivors were dealt with. In this test a large number of preliminary temperatures were taken, the animals injected at 3.30 p. m. on the 25th and temperatures taken at the third hour and continued for over twenty-four hours.

In the cases of some of the added cattle, dates other than those just mentioned will be noticed. These tests which were not made at the station were all of the usual nature.

Koch's tuberculin was used, and while the doses were graded to suit the different ages of the animals, they were never any larger than would have been administered in an ordinary official test. It was unfortunate that the animals had to be tied up when being tested, as this was an interference with their usual habit of life, but every precaution was taken to prevent their becoming

annoyed or excited, and I do not think that in any one case the results of the test were affected from this cause.

At the conclusion of the experiment all the animals then alive, except those which had been clearly shown to be healthy by repeated tests and isolated accordingly, were killed. Most of them were buried on the premises, but those whose condition warranted such a course, were slaughtered under careful inspection for use as food.

ORIGINAL HERD.

The age given is that of the animal at the time of slaughter or at the close of the experiment.

No. 1. *Maggie*.—Grade Ayrshire cow, 7 years.

Never showed clinical evidence of tuberculosis.

(Ceased Reactor.)

Reacted May, 1905; October, 1905; September, 1906;
May, 1907.

Tested without reaction October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Small tubercular nodule left lung; caseated purulent lesions, posterior mediastinal glands.

Progeny.—(1a) Bull calf born February, 1907, always healthy and thrifty.

Tested without reaction October, 1907, September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 2. *Winnie*.—Grade Guernsey cow, 7 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905.

Tested without reaction, September, 1906; May, 1907;
October, 1907.

Reacted September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Tubercular lesions both lungs, some encysted, others recent; purulent tubercular nodules size pigeon's egg in peritoneum; small encysted and calcified lesions in posterior mediastinal and mesenteric glands.

Progeny.—

- (2a) Bull calf, born January, 1907 (cryptorchid).
Not tested.

Slaughtered June, 1907.

Autopsy—No evidence of tuberculosis.

- (2b) Bull calf born April, 1908; always healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Slaughtered April 26, 1909.

Autopsy.—No evidence of tuberculosis.

No. 3. *Yellow Kate*.—Imported pure bred Ayrshire cow, 9 years.

Animal lost flesh rapidly winter of 1906-7, when she nursed two calves; afterwards improved, but never again became fat, although showing no clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions left lung; some purulent, others encysted; calcified lesions anterior and posterior mediastinal glands; many small calcareous encysted nodules in mesenteric glands.

Progeny.—

- (3a) Heifer calf born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; September, 1908; February, 1909.

Has since remained healthy.

- (3b) Bull calf adopted December, 1906.
Healthy and thrifty.
Tested without reaction October, 1907.
Reacted September, 1908; November, 1908; February, 1909.
Slaughtered March 6, 1909.
Autopsy.—Left post pharyngeal gland tubercular, caseous. No other lesions.
- (3c) Bull calf adopted December, 1906.
Died October, 1907, of diarrhoea.
Autopsy.—Very small tubercular lesions in one post pharyngeal gland.
- (3d) Bull calf born May, 1908, healthy and thrifty.
Reacted September, 1908.
Slaughtered October 21, 1908.
Autopsy—Tubercular lesions posterior mediastinal glands.

No. 4. *Sarah*.—Pure bred Ayrshire cow 3 years.
Never showed clinical evidence of tuberculosis.
Reacted May, 1905.
Tested without reaction October, 1905; September, 1906; May, 1907.
Doubtful reaction July, 1907; October, 1907.
Reacted September, 1908.
Tested without reaction November, 1908.
Slaughtered November 19, 1908.
Autopsy.—No evidence of tuberculosis.

Progeny.—(4a) Heifer calf born December, 1906, healthy and thrifty, no evidence of tuberculosis.
Tested without reaction July, 1907; May, 1908; November, 1908; February, 1909.
(See note.)
Slaughtered February 19, 1909.
Autopsy.—Right lung contained six purulent cavities, each as large as an egg; tubercular process involving

visceral, diaphragmatic and costal pleural surfaces, right side of thorax; anterior and posterior mediastinal glands also tubercular.

No. 5. *Norah*.—Pure bred Ayrshire cow, 6 years.

Never showed clinical symptoms of tuberculosis.

(Ceased Reactor.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—No lesions of tuberculosis detected.

Progeny.—

(5a) Bull calf at foot on arrival at station, always healthy and thrifty.

Tested without reaction September, 1906.

Has since remained healthy.

(5b) Bull calf born January, 1907, healthy and thrifty.

Tested without reaction July, 1907; May, 1908; November, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis detected.

(5c) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 6. *Mamie*.—Pure bred Ayrshire cow 5 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906; May, 1907.

Tested without reaction October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Small encysted tubercular nodules anterior and posterior mediastinal glands. Caseous and encysted nodules in cervical lymphatic glands.

Progeny.—

(6a) Heifer calf (twin) born December, 1906, always healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908; November, 1908; February, 1909.

Slaughtered April 26, 1909.

Autopsy.—No evidence of tuberculosis.

(6b) Bull calf (twin) born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908.

Slaughtered Dec. 21, 1908.

Autopsy.—No evidence of tuberculosis.

(6c) Heifer calf born April, 1908, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 7. *Beatrice*.—Pure bred Ayrshire cow, 8 years.

Showed no clinical evidence of tuberculosis.

Reacted October, 1905; September, 1906.

Died January, 1907, from broncho-pneumonia, contracted through being mired in creek.

Autopsy.—Small encysted tubercular lesions in peri-bronchial, anterior and posterior mediastinal glands.

Progeny.—(7a) Heifer calf born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908; November, 1908.

Has since remained healthy.

No. 8. *Minnie*.—Pure bred Ayrshire cow 5 years.

Never showed clinical evidence of tuberculosis.

(Ceased Reactor.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Slight encysted lesion in left lung. Encysted lesions in mesenteric gland.

Progeny.—

(8a) Heifer calf born November, 1906, healthy and thrifty.

Tested without reaction July, 1907.

Doubtful reaction November, 1907.

Reacted September, 1908.

Doubtful reaction November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Traces of previous peritonitis; no positive evidence of tuberculosis found in spite of careful examination.

(8b) Bull calf adopted November, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Has since remained healthy.

(8c) Bull calf born June, 1908.

Died from navel infection June 30, 1908.

Autopsy.—No evidence of tuberculosis.

No. 9. *Sonsy*.—Pure bred Ayrshire cow $12\frac{1}{2}$ years.

Tuberculosis of the udder detected on arrival at station. The following year showed clinical symptoms.

(Clinical.)

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907.

Doubtful reaction July, 1907.

Slaughtered September 27, 1907.

Autopsy.—Generalized tuberculosis, pharyngeal glands caseated, left hind quarter udder caseated, also entire mesen-

teric chain bronchial and mediastinal glands and pericardium affected. Tubercular deposit on pleural surfaces, both lungs adherent to costal pleura; portal glands affected, tubercular deposit on peritoneum, liver and one kidney.

Progeny.—

- (9a) Heifer calf born 1905; arrived at station at foot, healthy and thrifty.

Tested without reaction September, 1906; December, 1906; May, 1908.

Has since remained healthy.

- (9b) Bull calf born February, 1907. Did not thrive and although apparently healthy at birth and for some time afterwards, failed to develop and was noticed to cough occasionally—remained thin.

Tested without reaction July, 1907.

Reacted October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Few nodules on lung surfaces, mediastinal and bronchial glands slightly affected.

No. 10. *Guernsey Heifer*.—4½ years.

While showing no definite symptoms, remained thin and unthrifty. Gave birth to two calves, one premature and one stillborn.

Reacted October, 1905; September, 1906; May, 1907; October, 1907; September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Open tubercular lesions, caseat purulent in lungs; similar lesions in liver; intestinal ulcer, grape formation on costal pleura, nodules on diaphragm and spleen; lymph glands encysted; purulent lesions in post pharyngeal; purulent and encysted lesions in peribronchial, purulent broken down lesions in anterior and posterior mediastinal; encysted lesions in the periportal glands. Caseous lesions

generally distributed throughout the mesenteric glands and encysted lesions in the trunk lymphatic glands.

Progeny.—(10a) Bull calf adopted January, 1907, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.
Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 11. *Grade Ayrshire Heifer "A."*—Four years.

Exhibited clinical symptoms almost immediately after arrival at station, which continued to develop, although occasional temporary improvement was noticeable. Finally became greatly emaciated. Before slaughter she exhibited distressed breathing, was hide bound and suffered from diarrhoea. Gave birth to premature calf soon after arrival and reared one adopted one. She was also the dam of another (No. 22), which arrived at station when 6 months old. As will be noted, the adopted calf was tested three times, reacting to the two last tests.

(Clinical.)

Reacted October, 1905; September, 1906.

Tested without reaction May, 1907.

Slaughtered June 10, 1907.

Autopsy.—Generalized tuberculosis. Extensive lesions in lungs, breaking down, pus escaping from bronchial tubes. Tubercular deposits in retropharyngeal, anterior, posterior bronchial and mesenteric also sub-lumbar lymphatic glands.

Progeny (See No. 22).—(11a). Bull calf adopted September, 1906. No clinical symptoms, but unthrifty.

Tested without reaction May 1907.

Reacted October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Caseated and calcified tubercular lesions right lung; encysted and calcified lesions in peribronchial and in anterior mediastinal glands.

No. 12. *Ayrshire Heifer "B."*

Never showed clinical evidence of tuberculosis.

Reacted October 1905; September, 1906.

Tested without reaction May, 1907.

Doubtful reaction October, 1907.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Tubercular lesions at base of each lung; tissue involved in both being size of man's fist, and having direct connection with bronchi. Small lesions in anterior and posterior mediastinal glands.

Progeny.—

(12a) Bull calf arrived at station at foot, healthy and thrifty.

Tested without reaction September, 1906; December, 1906; May, 1907.

Has since remained healthy.

(12b) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Small calcified tubercular lesions in right posterior pharyngeal lymphatic gland; posterior mediastinal glands hemorrhagic; no other lesions.

No. 13. *Polly*.—Grade cow 5 years.

Never showed evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Tubercular lesions on pleura, taken for chronic tubercular pleurisy. Some sub-pleural tubercular nodules. No other lesions.

Progeny.—

(13a) Bull calf born December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

(13b) Bull calf adopted December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

(13c) Heifer calf born May, 1908, appeared healthy and thrifty.

Reacted September, 1908; February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Very small calcified tubercular lesions in posterior mediastinal glands. No other evidence of tuberculosis.

No. 14. *Jessie*.—Grade Ayrshire, 5 years.

No clinical evidence of tuberculosis.

(Ceased reactor.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Small purulent nodules (tubercular) partially encysted inferior lobe left lung, also small nodule in posterior mediastinal glands.

Progeny.—

(14a). Heifer calf born January, 1907; healthy and thrifty.

Tested without reaction October, 1907; September, 1908; February, 1909.

Has since remained healthy.

(14b) Heifer calf born May, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 15. Lydia Rooker.—Pure bred Holstein cow 7 years.

Showed no symptoms of disease although for some time suspected of udder tuberculosis. Owing to this suspicion her milk was repeatedly subjected to microscopical examination, without result, so far as the detection of tubercule bacilli was concerned.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.

Reacted February, 1909.

Slaughtered March 6, 1909.

Autopsy.—No evidence of tubercular infection.

Progeny.—

(15a) Heifer calf born January, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—No evidence of tuberculosis.

(15b) Steer calf adopted January, 1907. Did not thrive very well, but remained apparently healthy.

(Adopted.)

Doubtful reaction October, 1907; September, 1908.
Tested without reaction November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Calcified tubercular lesions in posterior mediastinal glands.

No. 16. *Rex's Maud*.—Pure bred Guernsey cow 13 years.

Showed no symptoms of disease save an occasional cough. At times run down in condition, but not more than might reasonably be expected in an aged animal kept previously under artificial conditions.

(Clinical.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October 1907.

Doubtful reaction September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions at base of both lungs; in the right caseous and purulent; in the left purulent opening direct into a bronchial tube through which pus was escaping. This pus proved infective to a guinea pig, proving the animal to have been a source of danger to others. Adhesions present on the costal pleuræ; caseated and encysted nodules in anterior and posterior mediastinal glands. Caseous and encysted nodules in periportal glands; numerous calcareous encysted nodules in the mesenteric glands and caseated nodules in the thoracic trunk glands.

Progeny.—

(16a) Heifer calf born February, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Reacted September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Small tubercular lesions along posterior border left lung; few tubercular nodules in the anterior mediastinal gland.

- (16b) Bull calf born May, 1908, healthy and thrifty.
Tested without reaction September, 1908; February, 1909.
Has since remained healthy.

No. 17. *Curly*.—Grade Guernsey cow 7 years.

Always in excellent condition; never showed any evidence of tuberculosis.

Reacted October, 1905; September, 1906.

Doubtful reaction May, 1907.

Slaughtered June 20, 1907.

Autopsy.—Generalized tuberculosis, both lungs full of tubercular lesions; extensive adhesions both sides of thoracic cavity; tubercular lesions in the retropharyngeal, prepectoral, anterior and posterior mediastinal, bronchial mesenteric and inguinal glands; stenosis of the os-uteri.

Progeny.—None.

No. 18. *Bonny Lass*.—Pure bred Ayrshire cow 4 years.

Showed no symptoms of disease; always in good condition.

Reacted October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908.

Tested without reaction November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Extensive caseous and purulent lesions in both lungs with direct communication to the bronchial tubes; caseous and encysted lesions in the peribronchial anterior and posterior mediastinal and encysted and calcified lesions in mesenteric glands.

Progeny.—

- (18a) Heifer calf born November, 1906, healthy and thrifty.

Tested without reaction July, 1907.

Reacted November, 1907; September, 1908.

Slaughtered November 13, 1908.

Autopsy.—Limited number of solitary tubercles about size of millet seed in apex of right lung. Tuberculous nature of these confirmed by microscopic examination; inflammatory changes in posterior mediastinal glands, but no definite tubercle formation. These changes were shown to be tubercular by microscopic examination.

(18b) Heifer calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 19. *Holstein Heifer "B."*—Four years.

Kept in good condition; showed no evidences of tuberculosis.

(Ceased Reactor.)

Reacted May 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907; September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Areas of tubercular infection omentum; calcified lesions in peribronchial anterior and posterior mediastinal glands; small tubercular area, anterior portion left lung. Open.

Progeny.—(19a) Bull calf born November, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 20. *Holstein Cow "A."*—Four and one-half years.

Always in good condition; never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906.

Reacted May, 1907; September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions in peribronchial and posterior mediastinal glands; caseous, some undergoing calcification.

Progeny.—(20a) Heifer calf, born December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908; February, 1909.

Has since remained healthy.

No. 22. *Ayrshire Grade Heifer*, calf of No. 11.—Three and one-half years.

Never showed clinical evidence of tuberculosis.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Tubercular lesions evidently of recent origin found on posterior mediastinal and peribronchial glands.

Gave birth to two calves, both of which died at birth or immediately after. In these a careful post-mortem examination failed to reveal evidence of tuberculosis.

No. 28. *Togo*.—Pure bred Ayrshire bull, 4½ years.

Developed well, remained thrifty, no clinical evidences of tuberculosis.

Reacted October, 1905; September, 1906; May, 1907; October, 1907; September 1908.

Slaughtered October 21, 1908.

Autopsy.—Calcified tubercular lesions in anterior and posterior mediastinal glands. No other lesions detected.

No. 29. *Holstein Cow*.—Four years.

Never showed clinical evidences of tuberculosis.

Reacted May, 1905.

Tested without reaction October, 1905 (high preliminary temp.); September, 1906; May, 1907; October, 1907.
Reacted September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Small ulcerated area and small nodule on omentum. Also small nodule on liver. Microscopical examination of these lesions failed to reveal presence of tuberculosis.

Progeny.—(29a) Heifer calf born April, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Slaughtered Nov. 13, 1908.

Autopsy.—No evidence of tuberculosis detected.

No. 30. *Guernsey Grade Cow*.—Four years.

Condition of this animal varied considerably; showed no clinical symptoms of tuberculosis, but was never fat.

Reacted October, 1905.

Tested without reaction September, 1906.

Reacted May, 1907; October, 1907; September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions present in liver appearing as small excrescences of an active type on its external surface while the body of the organ contained a tubercular mass 5 inches in diameter. Excrescences on peritoneum, nodules in lymph glands; encysted lesions in posterior mediastinal and periportal glands; encysted and purulent lesions in some of the mesenteric and encysted lesions in the abdominal trunk glands.

Progeny.—

(30a) Heifer calf, born January, 1907. Remained apparently healthy until February 13, 1907, when it was attacked with diarrhoea, which, however,

yielded to treatment in about eight days. Few days later became dull, elevated temperature, cough at intervals. Cough gradually became more frequent, respirations more rapid; nasal discharge. Gradually became worse and died March 11, 1907.

Autopsy.—Tubercular lesions right lung; also in thymus gland which was full of miliary tubercles; few tubercles also in parenchyma of spleen.

(30b) Heifer calf born April, 1908, healthy and thrifty. Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 31. *Ayrshire Cow*.—Four years.

Never showed clinical evidence of tuberculosis.

Tested without reaction October, 1905; September, 1906; May, 1907; October, 1907; September, 1908; February, 1909.

Has since remained healthy.

Progeny.—(31a). Bull calf born June, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909. Has since remained healthy.

This disposes of the original herd. The following animals are those which, as has already been stated, were introduced to the herd from time to time during the course of the experiment.

No. 45. *Bloomer*.—Pure bred Ayrshire cow.

Arrived station June, 1906; never showed clinical evidences of tuberculosis.

Reacted November, 1905.

Doubtful reaction December, 1905.

Tested without reaction April, 1906; September, 1906; May, 1907.

Reacted October, 1907; September, 1908.

Slaughtered November, 1908.

Autopsy.—Tubercular lesions left lung, with area undergoing caseation, with communication to bronchial tubes. Caseating lesions anterior and posterior mediastinal, mesenteric and lymphatic glands.

Progeny.—(45a) Heifer calf born June, 1907, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Purulent lesions left post-pharyngeal gland. No other lesions detected.

No. 46. *Maggie II.*—Pure bred Ayrshire cow.

Arrived station June, 1906; in poor condition, wild excitable and vicious. Later became quiet and improved in condition.

Reacted November, 1905.

Tested without reaction December, 1905; April, 1906; September, 1906; May, 1907; October 1907.

Reacted September 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions base of right lung; caseating, purulent, encysted; apparently an open case.

Progeny.—(46a). Heifer calf born April, 1907, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 65. *Canada Regens.*—Pure bred French Canadian cow.—Four and one-half years.

Arrived at station December, 1906; apparently healthy except for persistent cough.

Reacted September, 1906.

Doubtful reaction May, 1907.

Reacted October, 1907.

Reacted September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Lesions tubercular in mesenteric glands. One lesion size of ostrich egg, involving a single gland and causing obliteration of the entire glandular structure. External portion of this mass was calcified; in the center a cavity about the size of a hen's egg containing a serous exudate. No other lesions.

No. 66. *Legacy*.—Pure Ayrshire cow, 5 years.

Animal arrived at station December, 1906, in fair condition, but never laid on flesh.

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September 1908.

Slaughtered October 18, 1908.

Autopsy.—Limited encysted tubercular lesions right lung. Caseated nodules in anterior mediastinal, posterior mediastinal and peribronchial glands; encysted nodules in peribronchial and few caseated nodules in mesenteric glands.

Progeny.—

(66a) Heifer calf, adopted December, 1907, healthy and thrifty.

Reacted October, 1907; September, 1908.

Tested without reaction November, 1908; February, 1909.

Slaughtered March 7, 1909.

Autopsy.—Caseated and calcified tubercular lesions in anterior mediastinal glands. No other indications of tuberculosis detected.

(66b) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction, September, 1908.

Slaughtered October 22, 1908.

Autopsy.—No evidence of tubercular infection.

No. 67. *Maggie III.*—Pure bred Ayrshire cow 3 years.

Arrived at station December, 1906. Unthrifty but no clinical evidence of tuberculosis.

(Ceased Reactor.)

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—No evidence of tuberculosis detected.

Progeny.—(67a) Bull calf born June, 1908.

Tested without reaction September, 1908; February, 1909.
Has since remained healthy.

No. 68. *Denty Girl.*—Pure bred Ayrshire cow 5 years.

Arrived at station December, 1906, in fair condition,
but with persistent cough.

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—No lesions of tuberculosis found in thoracic or abdominal cavities. Left popliteal gland caseated and purulent. Tubercular bacilli were found in pus and proved infective on a guinea pig inoculated therewith.

Progeny.—

(68a) Heifer calf adopted, transferred from Beatrice No. 7, January, 1907, on the death of that animal, healthy and thrifty.

Reacted October, 1907; September, 1908.

Tested without reaction November, 1908.

Reacted February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Caseous tubercular lesions post pharyngeal glands. Caseous and calcified lesions in periportal gland. Calcified lesions in posterior mediastinal gland and in peribronchial glands.

(68b) Heifer calf born January, 1907, healthy and thrifty.

Tested without reaction July, 1907; November, 1907.

Has since remained healthy.

(68c) Bull calf born April, 1908, healthy and thrifty.

Reacted September, 1908; February, 1909.

Slaughtered February 19, 1909.

Autopsy.—One calcified tubercular nodule size of pigeon's egg, right posterior mediastinal gland.

No. 78. *Jersey Grade Cow*.—Eight years.

Arrived at station January, 1907, in fair condition, but with persistent cough. Gradually lost flesh, cough becoming more troublesome accompanied by nasal discharge.

Reacted May, 1907; July, 1907; October, 1907.

Died July 31, 1908.

Autopsy.—Inflammatory peritoneal adhesions; kidneys enlarged and congested with hemorrhages in the parenchymatous portions; abdominal lymphatic glands, including mesenteric and periportal, involved in tubercular lesions, which were of two kinds; some wholly encysted and walled off from remaining glandular tissue; others recently formed, scarcely visible to the naked eye, with hemorrhages, apparently resulting from tuberculous septicemia. Fallopian tubes presented very advanced tubercular condition, the giant cells having been destroyed and each field of the microscope showing a mass of tubercle bacilli.

Progeny.—(78a) Bull calf born July 1907, healthy and thrifty.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Left postpharyngeal gland purulent and calcified.

No. 82. *Count Cedric*.—Pure bred Shorthorn bull, $2\frac{1}{2}$ years.

Arrived at station July 4, 1907. Condition varied considerably; during fall of 1907 became emaciated, refused food; persistent high temperature; later improved, but never regained perfectly healthy appearance.

Reacted November, 1908; May, 1907; October, 1907; September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Tubercular lesions in postpharyngeal, anterior and middle cervical glands, which were completely broken down and contained in each instance large quantity purulent material. Caseated lesions in anterior mediastinal gland. Carcass greatly emaciated.

No. 84. *Flossie's Gem*.—Pure Guernsey cow 4 years.

Arrived at station May, 1907; showed no clinical evidence of tuberculosis.

Reacted May, 1907.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Slight pleuritic adhesions not definitely tubercular. Tubercular nodules omentum, purulent tubercular lesions in postpharyngeal glands.

Progeny.—(84a). Heifer calf born October, 1907, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 31, 1908.

Autopsy.—No evidence of tubercular infection.

No. 85. *Ottawa Fortune*.—Pure bred French Canadian heifer 3 years.

Arrived at station May, 1907; unthrifty persistent cough, rapid breathing.

Reacted May, 1907.

Doubtful reaction October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Tubercular lesions well marked, lungs badly affected, about one-quarter caseated, covered with nodules in grape formation. Much pleuritic adhesion; portal, mesenteric and lymphatic glands badly affected. Large nodules on liver.

No. 86. *Illuminata* 3d.—Pure bred Shorthorn heifer 3 years.

Arrived at station May, 1907; unthrifty, but no definite symptoms of disease.

Reacted May, 1907; highest temperature 10 hours after injection, 107.6, with pronounced clinical disturbance.
(See Note.)

Tested without reaction October, 1907.

Slaughtered November 25, 1907.

Autopsy.—No evidence of tubercular infection.

Progeny.—(86a) Bull calf born July, 1907; unthrifty but no clinical symptoms.

Doubtful reaction September, 1908.

Tested without reaction November, 1908.

Doubtful reaction February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Slight pleuritic adhesion, which could not be considered as positive evidence of tuberculosis. Subsequent pathological investigation failed to give any confirmatory data.

No. 98. *Flora*.—Pure bred French Canadian cow 5 years.

Arrived at station May, 1908. Never showed clinical evidence of tuberculosis.

Reacted May, 1908.

Doubtful reaction September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Few localized lesions (tubercular), evidently recent and active in both lungs. Purulent lesions large and small beneath peritoneum at border of omentum, near attachment to stomach. Twenty of these tubercular abscesses, each containing thick, creamy pus. No other lesions detected.

Progeny.—(98a) Heifer calf born May, 1908, more or less unthrifty.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—No evidence of tubercular infection.

No. 99. *Grey Grade Steer*.—One year.

Arrived at station May, 1908. No evidence of tuberculosis.

Tested without reaction May, 1908; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 100. *Red Steer*.—One year.

Arrived at station May, 1908. No evidence of tuberculosis.

Tested without reaction May, 1908; September, 1908.

Slaughtered December, 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 101. *Guernsey Bull*.—Pure bred, 1 year.

Arrived at station September, 1908; showed no evidence of tuberculosis.

Reacted May, 1908; June, 1908.

Doubtful reaction August, 1908.

Reacted September, 1908.

Slaughtered October 31, 1908.

Autopsy.—Tubercular lesions undergoing caseation at base of both lungs; tubercular lesions in peribronchial glands.

No. 102. Red Grade Heifer Calf.

Arrived at station November, 1907, apparently healthy; no clinical evidence of tuberculosis.

Tested without reaction November, 1907; September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Tubercular lesions in anterior and posterior mediastinal glands; tubercular area about size of egg in right lung, containing caseated and calcified nodules, with direct discharge into bronchial tubes.

No. 103. Jersey Cow.—Pure bred 5 years.

Arrived station September, 1907, in fair condition, but persistent cough.

Reacted October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Tubercular lesions well marked; portions of lung tissue solidified. Large areas caseated; numerous cavities containing pus; tuberculous nodules, liver and pleura and in portal and mesenteric glands.

A reference to the list will show that cows Nos. 1, 5, 8, 14, 19 and 67 are classed as "Ceased Reactors." The post-mortem findings in these cases will be found especially interesting.

Three other cases (Nos. 9, 11 and 16) classed as "Clinical," also ceased to react, apparently owing to the disease having become generalized.

Eleven animals (Nos. 4, 5, 6c, 8a, 15, 15a, 29a, 67, 84a, 86 and 98a) reacted but failed on post-mortem examination to show any evidence of tuberculosis. Such cases are, as is well known, not at all uncommon. They furnish no argument against the reliability of tuberculin, but rather the opposite, occurring as they do in animals in which the disease is either of very recent origin or in which the lesions are so small or so deeply seated in unusual locations as to render their detection a matter

of great difficulty. A striking instance of the last-mentioned condition is furnished by No. 68, in which the disease was confined to one popliteal gland.

The history of No. 86, although short, is very interesting and instructive. The pronounced reaction shown by this animal in May, 1907, would appear to indicate that the infection in her case was recent and very slight, while her subsequent record suggests the possibility of the progress of the disease having been at least temporarily arrested.

Of the two animals which died of tuberculosis, namely Nos. 30a and 78, one was a calf of two months in which the disease was probably congenital; the other, an aged Jersey cow, had reacted three times, the last test being ten months before death.

Special attention is directed to No. 4a, which, on being slaughtered on February 19, 1909, when over two years old, was found to be badly affected with tuberculosis, although it had never shown any evidence of disease and had been tested four times without reaction, the periods elapsing between the tests being ten, six and three months respectively.

This case is both interesting and instructive, showing as it does that an animal, while still retaining externally the appearance of health, may within a comparatively short period, become affected to such an extent as to nullify the action of tuberculin. Giving this heifer the benefit of the full period of incubation possible, as stated by our best authorities, namely, fifty days, the disease must, to all appearance, have been contracted not more than five months before the last test to which, as has been shown, there was no reaction.

Among the most noteworthy cases may be mentioned No. 17, an animal which was always fat, and which was expected to make excellent beef, but whose carcase was condemned for generalized tuberculosis. In view of the actual conditions revealed by the post mortem, the doubtful reaction obtained from this animal a month before slaughter is particularly interesting.

The individual record of No. 22 is also instructive, especially when the history of her dam, No. 11, is taken into consideration.

The exceedingly well marked reactions given by No. 28, "Togo," at each time of testing are noteworthy, in view of the comparatively slight lesions found on post mortem.

Perhaps the most striking feature of the whole experiment is the fact that sixteen mature animals (Nos. 2, 3, 4, 6, 12, 13, 15, 18, 20, 29, 30, 45, 46, 66, 68, 84) which positively reacted in from one to four tests, became ceased reactors, but subsequently reacted again. In two of these animals the autopsy failed to reveal any evidence of tuberculosis, while in another the results were doubtful.

All the thirteen others were found to be diseased, although the degree of infection varied very greatly.

Special attention is directed to the post-mortem findings in No. 68. The diseased popliteal gland which was the only evidence of tuberculosis found would scarcely have been detected in the ordinary abattoir inspection and might easily have been missed in even a reasonably thorough post-mortem examination.

The fact that a number of these animals failed to react to the same tests, and that their subsequent reactions also occurred simultaneously may suggest to some minds the possibility of these apparent eccentricities being due to a variation in the tuberculin used or to some other peculiar condition affecting the test.

It must be remembered, however, that not only did several mature animals, among which may be specially mentioned Nos. 10, 28, 65 and 82, reacted regularly to the tests to which these others failed to respond, but that many other animals, as will be seen from their individual records, also reacted to one or more of these tests.

Exclusive of those born dead, of which there were several, and those which died from causes other than tuberculosis, the number of calves entering into the experiment was fifty-two (52). Of these forty (40) belonged to the original herd, thirty-three (33) being progeny and seven (7) adopted, while of the remaining twelve (12) two (2) were adopted, and ten (10) the offspring of the cows subsequently introduced.

Of these, twenty-nine (29), comprising twenty-five (25) of the original herd, and four (4) from the added stock, escaped infection; twenty-one (21) contracted tuberculosis, and two (2) (Nos. 29a and 86a) were suspicious, having given doubtful reactions, but no evidence of disease on post-mortem examination.

No. 4a gave ample evidence of infection on post mortem, without having at any time reacted, while Nos. 6c, 8a, 15a, 84a and 98a reacted positively, but gave no post-mortem proof of infection.

Giving one of the two (2) doubtfuls to each gives us approximately 60 per cent. of healthy calves as against 40 per cent. infected.

Of the calves both of the original herd, twenty-two (22) escaped infection, ten (10) became diseased, and one (1) remained doubtful, the proportion of healthy calves in this lot being therefore about 66 per cent., a showing somewhat worse than was anticipated, when in September, 1908, the experiment being then unfinished, I stated that twenty-five per cent. (25 per cent.) of the calves of these particular cows were likely to prove diseased.

Of the adopted calves three (3) only remained healthy, while six proved to be infected, thus exactly reversing the percentage given above in the case of the calves born of the original herd.

Of the calves born of the cows brought to the station subsequent to the arrival of the original herd, four (4) only escaped infection, while five (5) became diseased, and one (1) was classed as doubtful. The percentage of diseased animals in this case was also much larger than in the original herd, a result which is not surprising, when the large number of advanced clinical cases of tuberculosis among the dams is taken into account.

Of the calves, seventeen (17) in all, which remained healthy and alive at the close of the experiment, three (3) were born in 1905; five (5) in 1906; three (3) in 1907 and six (6) in 1908.

Of the thirteen (13) which failed to react, and were found healthy on slaughter, six (6) were over two years old, five (5) were over one year, and two (2) were six months old.

Summarizing the results of the experiment, on the lines laid down at its inception, it will be seen that, even under the limitations attributable to the removals and additions which were unfortunately permitted, these results are not entirely valueless.

So far as the effects of open air treatment on the animals themselves are concerned, it may be noted that among the members of the original herd, five (5), namely, Nos. 1, 5, 8, 14 and 19, ceased to react; that in one of these, No. 5, the post-mortem examination revealed no evidence of disease, while in No. 8 the slight lesions found were all encysted. The conditions in Nos. 1 and 14 were less satisfactory, while that of No. 19 was decidedly discouraging.

Among the added cows will be found another, No. 67, which, entering the herd in December, 1906, also became a ceased reactor, and in her case the autopsy failed to reveal the existence of disease.

As has already been stated, eleven (11) cows of the original herd and five (5) of those added later also became ceased reactors, but afterwards began again to react. The fact that in three of these, Nos. 4, 15, and 29, no satisfactory evidence of tuberculosis was found on post mortem, suggests a recent reinfection. Whether or not the recrudescence of the disease which had apparently taken place in all the others of this lot, was due, as I have already suggested, to reinfection from the very virulent clinical cases introduced from outside, can only remain a matter of conjecture.

During the three years that the experiment was in progress, only one animal of the original herd, namely No. 11, actually broke down. This case showed clinical symptoms almost immediately after arrival and only lived a little over a year. She might, therefore, almost be classed with a number of the later arrivals which really came to the station only to die and were never considered as being of any experimental value.

Judging from the conditions found on post mortem a number of the other members of the original herd would, very shortly, have become active clinical cases.

The evidence on the whole leads to the conclusion that open air treatment is not likely to exercise any marked curative influence on animals already tuberculous, especially when reinfection is possible through cohabitation with clinical cases.

So far as concerns the securing of information regarding the extent to which healthy cattle kept in contact with diseased cattle are subject to infection, the experiment has proven of but little value. Had the seven healthy steers slaughtered in the fall of 1907, been allowed to remain with the herd throughout the whole experiment, the results would have been more interesting and valuable. It is true that they lived for over two years in close contact with tuberculous cattle without becoming infected. On the other hand, as most of the infection and reinfection, if such took place, apparently occurred during the year 1908, the fact that their slaughter took place when it did was very regrettable.

Of the other healthy animals, No. 31, a member of the original herd, was between October, 1905, and February, 1909, tested six times without reaction, and has since remained healthy, as has also her one calf; on the other hand, No. 22, which also came with the herd, after passing four tests without reaction, gave a positive reaction in February, 1909, and on post mortem showed very clear evidence of recent tubercular infection.

Nos. 99 and 100, which entered the herd in May, 1908, and which were twice tested without reaction, showed on slaughter in December, 1908, no evidence of tubercular infection.

No. 102, however, which entered the herd in November, 1907, and which also underwent two tests without reaction, reacted positively in February, 1909, and when slaughtered showed distinct evidence of tubercular infection.

A careful scrutiny of the individual records of the calves reared on the station will reveal a very few cases which might indicate that infection possibly took place after weaning. Most

of the calves, however, which became diseased, reacted at such an age as to indicate that they derived the infection direct from their dams.

In view of all the circumstances the evidence derived from this experiment, as to the likelihood of animals becoming infected under open air conditions, is of no great value.

The proportion of healthy calves raised from the whole herd, namely 60 per cent., is at first sight somewhat discouraging, but when it is remembered that, with one exception, No. 31, all the cows on which they were reared were affected with tuberculosis, that one had a tuberculous udder and that a number of the others were open and clinical cases, the matter assumes a somewhat different aspect. It is, I think, highly improbable that such a large percentage of healthy calves could have been obtained from a herd of the same kind under ordinary stable conditions.

In conclusion, I would say that while the results derived from this experiment are on the whole somewhat disappointing, they are not without value, inasmuch as they furnish a good deal of useful information regarding the eccentricities of bovine tuberculosis, as well as on the use of tuberculin for diagnostic purposes.

In this connection I would add that although I have not thought it advisable to burden this paper with the temperatures taken at each test, these figures are all available, and whether or not they are eventually published, it will give me much pleasure to furnish them to any one specially interested in this phase of the subject.

DR. W. H. DALRYMPLE, of the chair of veterinary science at the State University, has received a certificate of membership in the Author's Club, London, England. Dr. Dalrymple was recently admitted as a member of this organization in the list of "over seas" members. The fact that Dr. Dalrymple is a native of Scotland and frequently visits the British Isles, makes this membership of especial significance to him while in London. It was founded by Sir Walter Besant, and its General Council is composed of men well-known throughout the United Kingdom.
—*New Orleans Times-Democrat.*

NUCLEIN.*

BY HERBERT F. PALMER, B.S., D.V.S., CHICAGO, ILL.

Someone has said that Nuclein is one of nature's antitoxins. To this Dr. John Fearn, one of California's medical men, has added: "These antitoxins, of which we know many, and I think we shall know yet more, have in all probability existed from the very beginning of man's physical life. They have been in us and of us, but we did not know of them; it has taken the patient and continuous research of scientists of the nineteenth and twentieth centuries to reveal their presence to us. And yet we know comparatively little about them. An all-wise and benevolent Creator has provided an inner guard for the protection of life and health; these guards, for convenience, we will call phagocytes. It is the business of these guards to surround these bacteria and to destroy them. The business of destruction, for convenience, we will call phagocytosis. Now this fight is going on all the time in man's body. If bacteria are on top, then there is sickness, specific disease and trouble. If the phagocytes are on top, then there is health and freedom from disease."

Nuclein seems to possess both a chemical and physiological action. Physiologically, nucleins are said to form the chief constituents of the living cells, or in other words, nuclein is that constituent of the cell by virtue of which the histological unit grows, develops and reproduces itself. It is the function of the nuclein of the cell to utilize the pabulum within its reach. In reality the number of kinds of nuclein is limited only by the number of kinds of cells.

Chemically, it is the basis of that part of the cell designated as the nucleus, being a complex proteid body characterized especially by the large amount of phosphorus which it contains.

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The phosphorus exists in the form of nucleinic acid, which is combined with a highly complex basic substance. So far as is known the nucleinic acid of all nucleins is the same, but the basic part may and does differ in the various nucleins. The amount of nucleinic acid present is determined by the percentage of phosphorus freed from sulphur. This normally amounts to about 9.4 per cent. in the wheat product.

The veterinarian's interest in nuclein centers around the primary fact that the white corpuscles of the blood normally constitute the most important and probably the most numerous nucleated cells daily undergoing destructive changes.

To Miescher belongs the honor of first studying nucleins deliberately, and it was he who gave them the name. Nuclein is a comparatively new product, it being as late as 1874 that Miescher made his most important contribution to the knowledge of nucleins, while the names of our own countrymen, Vaughan, Novy and McClintock are intimately connected with all advances made in this line.

Right here let us depart a little and offer a tribute to those who are to-day on the active stage. Little can we realize how recent are the great advances made in veterinary medicine until we come to know that those men, whose names are so intimately associated with its advance, are to-day still upon the active stage. Metchnikoff, Vaughan, Novy and McClintock, all names of men now familiar in the study of nuclein, are to-day carrying on their great work.

Inasmuch as nuclein may be obtained from many kinds of cells, vegetable and animal both, its commercial preparation has brought into the field many sources of supply. In the earlier days Hoppe-Seyler prepared nuclein from yeast, Lubarin from casein, Plosz from blood corpuscles of birds, and Miescher from yolk of eggs. To-day, on a commercial basis, two sources are principally employed, one being yeast, the other the germ of wheat.

Nuclein, as derived from the germinating portion of the wheat kernel, encounters many difficulties in its manufacture.

but the high quality of the product justifies the extra expense involved. As thus produced it is absolutely uniform in strength, being standardized to a phosphorus-content of one milligramme to each cubic centimeter of nuclein solution.

I have thus tried to tell you what nuclein is and about its method of manufacture. The points now of interest are: What will nuclein do? and why use it in veterinary practice?

Nuclein is given to increase the defensive power of the blood against disease germs. In order to appreciate the "how" of the nuclein action it will be necessary to go back a little and explain the theory of Metchnikoff, which first led to its general use. Metchnikoff is to-day one of the workers at the Pasteur Institute of Paris, France, and, although better known to most people on account of his researches in connection with the lactic-acid ferments, it was he who gave us the theory of phagocytosis. To Pasteur, Metchnikoff, V. Behring and Koch belong the honor of first evolving a theory of immunity; Pasteur with his exhaustion or chemical theory and Metchnikoff with that of phagocytosis.

Similar to action of the amoebæ Metchnikoff noticed that leukocytes throw out arm-like processes which surround the bacterium, and he claimed that they virtually digest it. The leukocytes were found to be closely allied to the amoebæ. In noting their action he soon saw that their work was not confined to bacteria alone, but that organized and unorganized particles of various kinds fell prey to the leukocytes. They attack and may devour any invading organisms which they may meet, and thus rid the body of parasites. When they have thus taken care of all of the bacteria which have gained a footing in the body, the disease necessarily comes to an end. The defense of the animal economy, according to this theory, is entrusted entirely to phagocytosis and especially the leukocytes.

Some five years previous to the presentation of Metchnikoff's theory, Koch pointed out that leukocytes may develop bacteria and carry them to the regional lymph glands where the leukocytes themselves perish and the bacteria are deposited. The

latter do not necessarily suffer and may eventually be carried along the lymph stream and cause metastatic processes. If this occurred to any extent, leukocytosis might be a process to be feared rather than encouraged.

If a bacterium enters the tissues these cells may at once make their way to the site of the infection and proceed to ingest the bacteria and kill them intracellularly. In this way the animal recovers with or without transient illness.

The assemblage of leukocytes which takes place at any focus of irritation is almost certainly protective in character, and it has also been shown by Kantrack and others that the granules contained in the protoplasm of the leukocytes consist of substances which tend to combat the bacteria and stop their growth. Leukocytes carry away the products of inflammation and at times they may engulf the germs themselves. If the bacteria are too strong for the tissue defense, they continue to increase and multiply. More and more tissue is destroyed and increasing numbers of leukocytes gather to the spot and are killed. These dead leukocytes and the tissue liquefied by the bacterial enzymes constitute the abscess. This liquefaction of tissue proceeds from the center toward the surface and may go on until the surface is reached and the tissue detritus (pus) and the bacteria are together discharged from the body.

Leukocytes are attracted in large numbers into the area in which bacteria are situated. Leukocytes are always attracted where there is a slight injury, a hemorrhage, the presence of a poison, of a foreign body of any sort, or any dead or useless tissue. There can be no doubt that their function is protective. This is nature's way of overcoming the trouble, the leukocytes acting as natural scavengers. Under suitable conditions any phagocyte can ingest any abnormal body of suitable size and remove it to the nearest lymph gland.

Metchnikoff's theory was several steps in advance, in the claim that leukocytes became, as it were, educated or trained in their work in overcoming the bacterium, thus having greater

power to deal with it in future attacks. This educational method, he contended, made it possible for a great number of bacteria to be overcome and disease thus checked or warded off. In some cases, of course, the outcome of struggle may not be favorable to the animal, as the leukocytes may be repelled or killed by bacterial poisons, and hence insufficient phagocytosis occurs. We may thus say, as a general statement, that any animal is susceptible to a bacterial disease only when the leukocytes are unable to antagonize the bacteria successfully and in this miniature life and death struggle the bacteria win out.

The life of a leukocyte is a short one and is measured in days only. They do not propagate themselves, but are emitted from bone marrow, run their life course or are overcome by disease and die. Observations seem to show that leukocytes in excess of normal, produced as a result of the injection of certain substances such as nuclein, are deficient in activity. On the contrary Rosenau has shown that leukocytes in excess of normal produced as a result of infection, *e. g.*, leukocytes from cases of pneumonia, have greater phagocytic power than those of healthy persons. While to Metchnikoff really is due the credit for the discovery of phagocytosis and its bearing upon immunity, other and later workers have made many important discoveries concerning it. The phagocytic theory of immunity is now accepted only as modified by the humoral theory, in which it is claimed that certain substances in the fluids of the body constitute the important factor in opposing the invasion of bacteria; these substances have been given the name of alexins or protective substances.

Later came Ehrlich's side-chain theory of immunity, which virtually incorporated both the phagocytic and the humoral theories. This has been still further modified by Wright's opsonic theory, which really incorporates not only all of Ehrlich's theory, but also much of the chemical theory of Pasteur. Thus we now accept a theory built up by Pasteur, Metchnikoff, Ehrlich and Wright. Its growth has been an evolution of short duration, but mighty advancement. But be the cause of immunity what

it may, certain it is that Metchnikoff gave us a theory that forms a logical working basis for the action of nuclein.

Since leukocytosis was so important for the combating of infection, the conclusion was obvious that an increased leukocytosis must assist the organism more effectively, and attempts were made to produce this artificially by stimulating substances. It may be said in passing that the old-fashioned application of heat, vesicants, etc., all produced a hyperleukocytosis.

The first attempt to antagonize infections by inducing hyperleukocytosis is credited to Surgeon Santa Salieri, who was probably the first to attempt to increase the resistance of the peritoneum to infection. He gave endoperitoneal injections of a small amount of physiological salt solution by which the resistance of the peritoneum to *bacillus coli* infection was increased from seven to sixteen times.

We have thus dwelt at length on the theory of leukocytosis, as advanced by Metchnikoff, in order to demonstrate clearly the reasons for the administration of nuclein. Of one thing, all who have observed nuclein will agree: it increases the number of the white corpuscles of the blood, aiding phagocytosis, thus assisting nature to overcome disease. As Dr. V. C. Vaughan, of the University of Michigan, has said: "The polynuclear white blood-corpuscles are active agents in preventing or retarding the multiplication of pathogenic germs within the body." It is thus rational therapy to give an agent which will increase these substances. "This increase in the polynuclear corpuscles," said Vaughan, "may be produced by introducing into the animal the most distinctive constituent of these cells, which is nuclein."

Among some of the early demonstrators, Mikulicz-Radecki demonstrated that injections of 5 per cent. neutralized nucleic acid increased the power of resistance of the peritoneum to forty times the normal. Miyake about the same time demonstrated that the intraperitoneal injection of a one-half of one per cent. solution of nucleic acid was the most satisfactory. The effect

of nucleinic acid was so marked that the animal was able to resist twenty times the normal minimum lethal dose of bacillus coli.

Regarding the length of time which this leukocytosis lasts, Diez and Campora gave intraperitoneal injections as well as subcutaneous injections and found the leukocytosis to last about seventy-two hours.

In one series of cases in the human, one-half grain of nuclein was given every four days. In three hours the leukocytosis increased from 17,000 to 25,000, and was found to persist for twelve to forty hours.

Dr. Vaughan demonstrated that the effect of nuclein was transient and in order to secure any real benefit from its use nuclein must be administered repeatedly and at comparatively short intervals. We would naturally expect this result owing to the very short life period of leukocytes.

A few years ago quite remarkable results were obtained in the treatment of contagious abortion by local injections of yeast. The ration of the cure was not then fully understood. Since the nuclein theory has been evolved and so much commercial nuclein is made from yeast, it would not be surprising to assume that it was simply a phagocytosis induced by the nuclein obtained from the yeast through the vaginal walls.

And now comes forward one who advocates the use of nuclein locally. With a strong belief in the action of nuclein as a stimulant to leukocytosis, a theory is established and already borne out by clinical work, that nuclein may advantageously be applied locally. The direct application of nuclein to affected parts supposedly increase the number of leukocytes that act as natural scavengers, and thus gets rid of the invading germs.

Kassel, of Berlin, and Vaughan and McClintock, of Michigan, have found that nuclein has germicidal properties. The germicidal constituent of blood serum is a nuclein which is undoubtedly furnished by the polynuclear white corpuscles.

However, the immunity secured by repeated injections of smaller quantities of nuclein is not due to the direct germicidal effects of this substance, but to its stimulating effect upon

some organ whose function it is to protect the body against bacterial invasion.

The longer the nuclein injections are continued and the more frequently they are administered, the more complete the immunity secured. Nucleins are quite free from poisonous properties and hence there is no danger from cumulative effect. This has been shown by repeated daily injections for six months at a time without producing injurious effects.

The rate of increase of white corpuscles under the administration of nuclein depends on the individual, as there is no uniformity of increase.

Jacob Meisen, in his experimental work with nucleinic acid upon dogs, showed that subcutaneous injections of nucleinic acid gave a marked increase of leukocytes, in one case rising from thirty-three to fifty-two thousand.

Two French workers at the institute at Geneva have given us some definite and conclusive data on the use of nuclein.

Madam S. Daskalitza Kofmann, working under the direction of Dr. Koenig, after a series of experiments, concluded that the augmentation of leukocytes commenced about the seventh hour after injection, obtained their maximum about the twenty-fourth hour and began to diminish about the thirtieth hour. She noticed the simultaneous manifestation of hyperleukocytosis in the peripheric and heart blood, contending that it was only natural that there should be a lessened leukocytosis in the peripheric while an increased number should occur in the heart blood and vice versa.

In fifty-one cases Hannes obtained the impression that nucleinic acid had a strengthening action on the resistance of the peritoneum. He found an increase of leukocytosis amounting to from 9 to 144 per cent., and a diminution of the mortality from 40 to 20 per cent.

Chantemesse has shown that sodium nucleinate has the power of producing hyperleukocytosis to a higher degree than collargol. In connection with Nihit he found that the opsonic index normally 1.6 had risen to 2.4 twenty-four hours after injection.

The serum in this case had almost doubled in phagocytic power. M. Henkel found a solution of sodium nucleinate when used subcutaneously increased the number of leukocytes.

Dr. Edgar P. Ward, of St. Louis, after an exhaustive amount of research clearly demonstrated that the intravenous injection of nuclein in the human first, markedly increased the percentage of hemoglobin; second, that the number of red cells is decidedly increased, and third the specific gravity of the blood is almost uniformly brought up to or near the normal.

Much has thus been said about nuclein in general without coming down to the definite particular cases, on which nuclein should be used and what results we may expect to obtain from its use.

In all forms of disturbed metabolism (and therefore faulty cell repair) nuclein should be freely used. When there is insufficient metabolism arising from any cause, there is defective leukocytosis—a lowered resistance. The natural nuclein product is wanting and calls for its administration.

Nuclein may be administered (1) by the stomach; (2) subcutaneously; and (3) intravenously. The stomach route is the least desirable because it is difficult to find a time when the stomach is empty—the gastric secretions affect the composition of nuclein by altering it chemically so that we can hardly be certain of its action. Nevertheless some excellent results have been reported; in these cases it was given at frequent intervals (every one-half to two hours).

Very satisfactory results are obtained by administering nuclein subcutaneously. This method is excellent when a local hyperleukocytosis is desired, and if at all possible the injection should in such cases be made into or near the lesion in order to produce the increased leukocytosis, where it will do the greatest good. For general systemic effect the injections may be made anywhere, but it is best to inject the solution in a place where there is a large amount of loose areolar tissue under the skin, and where the latter can be freely lifted up from the subjacent tissues. From two to four hours afterward a swelling forms at

the point of injection, which generally disappears in the course of a few hours, but may persist for as long as half a day and may occasionally be quite painful.

Guillermin working under Askanzy at the institute at Geneva noted the fact that intravenous injection of nucleinic acid gave as marked leukocytosis as did the subcutaneous method.

The throwing of the nuclein directly into the blood stream by the intravenous method has gained preference in late years; it gives more certain results than do other methods of administration, and is attended with less pain and discomfort.

THE " Horsemen's Banquet " was held at the Hotel La Salle, Chicago, November 29, last. This dinner was given by the *Live Stock Journal* through its editor, Mr. Theodore Butterworth. The *Live Stock Journal*, founded by Mr. Butterworth twenty-two years ago, is one of the best horse papers published, and a friend and supporter of the veterinary profession.

IN perusing the November 9th edition of the *Breeder's Gazette* we had the pleasure of coming across a strikingly life-like picture of Dr. W. H. Dalrymple with his right hand affectionately grasping the left horn of a beautiful Jersey cow, addressing an audience of agriculturists from a car on the "Louisiana Special," on the types of cattle. This "Farm Special," operated by the Southern Pacific in connection with the Louisiana State University and its experiment stations, consisted of seven cars: two of implements and machinery, two of cattle and hogs, one of exhibits of farm crops and truck, a dining car and a drawing room car. It had a twelve-day run, including forty-two two-hour stops, and is unique in agricultural fair projects. It proved a marked success. We also read with much interest an article by Dr. Dalrymple in the *Gulf States Farmer*, entitled, "Veterinary Science and Agriculture," in which the doctor takes his readers through the conditions of veterinary medicine from the days of hoodooism and nostrums down to the present; explaining to them the relationship of the veterinarian to the stock-raiser and the public, in his broad conception of it, and finally giving them statistics and data on agriculture, especially in the South, that will prove very valuable to both the agriculturists and the profession he represents.

JOHNE'S DISEASE.

BY D. B. CLARK, STATE VETERINARIAN, MADISON, WIS.

"Johnne's Disease" is also known as "Specific Chronic Enteritis of Cattle," "Chronic Bacterial Dysentery of Cattle," "Enteritis Pseudo-Tuberculosa Bovis" and "Chronic Acid-Fast Bacterial Dysentery."

This disease was first described by Johne and Frothingham in 1895.¹ In 1904 Markus reported having seen the disease in Holland.² Cases have been reported in England, Germany, France, Belgium, Switzerland, Denmark, Norway and in various parts of the United States. The first case in America was diagnosed by the late Dr. Leonard Pearson in Pennsylvania in 1908.³ Later Beebe described cases he had seen in Minnesota and Wisconsin,⁴ and Mohler has observed cases in Virginia.⁵ I had the privilege, together with Dr. A. S. Alexander, of posting my first case, in Wisconsin, November, 1908.

From this brief statement it will be seen that the disease is quite widespread.

The first case described by Johne and Frothingham was in a six-year-old cow that had been scouring and slowly becoming emaciated for five months. Tuberculosis being suspected, the tuberculin test was applied with a slight reaction. The animal was killed and no tubercular lesions found. The only lesion noticed was a thickening of the walls of the small intestine. Upon microscopical examination this thickening was found to be due to a diffuse infiltration of the mucous membrane with lym-

* Presented to the forty-seventh annual meeting of the American Veterinary Medical Association, San Francisco, Cal., Sept., 1910.

¹ *Zeitschrift f. tiermedizin*, 21 Bd.

² *Zeitschrift f. tiermedizin*, Vol. 8.

³ AMERICAN VETERINARY REVIEW, February, 1908.

⁴ AMERICAN VETERINARY REVIEW, September, 1908.

⁵ Twenty-fifth Report, B. A. I., 1908.

phoid cells, an especially large number of epithelioid cells and a few giant cells. The epithelioid cells and giant cells contained a large number of small acid-fast bacilli, which could not be distinguished from tubercle-bacilli in staining properties. The organism was smaller than the tubercle-bacillus, and usually found in large numbers, located within the epithelioid and giant cells. They saw what they thought was caseation, but subsequent research has shown that what they thought was caseation was only a post-mortem change. They were of the opinion that this was a non-ulcerating form of intestinal tuberculosis due to an attenuated bacillus, probably the avian tubercle bacillus. Later investigators, such as Bang, McFadyean and others, are of the opinion that this is a specific disease in no way related to ordinary tuberculosis. They state that it differs from tuberculosis in that no caseation is found, no ulceration and the histological structure is not that of ordinary tuberculosis.

It is not my province to go into the bacteriological or minute pathological phases of this subject, nor am I sufficiently familiar with these considerations to discuss them in detail. To make my paper more complete, however, I will merely mention some of the more essential bacteriological and pathological considerations.

Up to the present time it has been impossible to isolate in pure culture the acid-fast organism which undoubtedly is the aetiological factor in this disease. So far as I know, it has been impossible to reproduce this disease in other species than the bovine. Dr. Bang, of Copenhagen, has been able to transmit the disease to healthy cattle by feeding them the parts of affected intestines of cattle that had died from the disease. All investigations have obtained uniformly negative results on attempts at inoculating laboratory animals such as guinea pigs, rabbits, hens, etc. The organism differs, therefore, from the ordinary tubercle-bacillus in that it is not virulent for ordinary laboratory animals, is an exclusive parasite in that it cannot be cultivated outside the animal body and that it produces no caseation. It resembles the tubercle bacillus in that in staining properties it is an acid-fast organism.

In this paper I shall discuss first, symptoms and course; second, gross post-mortem lesions; third, diagnosis, and fourth, treatment.

Symptoms.—The first indication of the disease is a great falling off in flesh of the animal without any apparent cause, the appetite remaining normal. In a longer or shorter time the animal begins to scour violently and may continue to do so for a few days or even as long as a month. The feces are almost as thin as water, dark in color and have a peculiar, disagreeable odor. This scouring may disappear for weeks or even months to again reappear. During these periods of remission the feces may become normal or nearly so, and the animal seems to pick up. We have found by weighing, however, that they maintain their body weight but do not increase in weight.

The intervals are followed by a rapid loss in flesh and usually but not always by renewed violent scouring. Quite often animals show their first symptoms immediately after calving, and the symptoms are more violent at this time, and rarely show any signs of improvement.

The disease most always attacks strong, vigorous, full grown cows. In Wisconsin we have never seen the disease in old cows nor in very young animals, but Bang reports having seen cases in young calves. We have only seen the disease in one bull. That this is the case is probably due to the fact that on the farms where we have observed the disease, the bulls are kept away from the rest of the herd except at time of service. In one case where a bull was affected, the animal ran for several hours a day in a paddock containing a pile of horse manure mixed with the manure from a cow suffering from the disease. It seems highly probable that the bull contracted the disease from this contaminated manure. This case also illustrates the infectious nature of the malady. Why young animals do not show symptoms of the disease is probably not due to any lack of infection, but since the course is so chronic the animals do not show symptoms until they are quite mature. The young animals may be infected, but are probably passing through the long period of incubation of the dis-

ease. This, however, is merely a suggestion and is not based on any scientific investigation.

The animals manifest no pain during scouring and have no abnormal temperature. During periods of scouring the animals may become prostrate and die, after having emaciated to mere skeletons and remaining prostrate for some days.

Bang mentions having seen cases where the customary scouring did not appear, the characteristic symptoms being then emaciation and falling off in milk yield.⁸ No such cases have been observed as yet in Wisconsin.

The duration of the disease after the first appearance of symptoms is from six months to three and one-half years. Three and one-half years is the longest time we have observed an animal live after showing symptoms of intermittent scouring. Dr. Bang writes of cases where an apparent recovery was made, but states that the observations were not conducted over a sufficient length of time to warrant any positive statement in regard to this matter. It has been our experience in Wisconsin that cases which have shown symptoms are uniformly fatal.

Post-mortem Findings.—At post mortem the cadaver appears very emaciated, the fatty tissue shrunken and jaundiced, but at times is normal. The folds of the abomasum appear oedematous. On outward examination the small intestine appears thickened in places. By running the intestine between the first finger and thumb you can feel the thickened portions of the organ. These thickenings will extend for from six inches to four feet and you may then feel a perfectly normal stretch of wall for some distance to be again succeeded by a stretch of thickened wall. As a rule the greater part of this thickening is found in the last two-thirds of the intestine. On opening the intestine its contents are scant and slimy. The Peyer's patches are either normal or somewhat swollen. At the thickened portions of the wall the mucous membrane is very much corrugated and folded. The direction of the fold is usually transverse to the lumen of the gut, but they may at times be longitudinal or

⁸ Ninth International Veterinary Congress, September, 1909.

oblique. The surface of the fold is smooth, while the depressions between the folds appear warty or granular. Dr. Bang in his early paper described this warty appearance and stated that it was due to tissue erosion or loss of substance, but in a subsequent paper corrects this view by stating that in freshly fixed sections the epithelioid covering appears intact on all parts of this granular surface.

Bloody haemorrhagic spots are occasionally seen on the surface but no ulcerations.

The mesenteric glands are often swollen, and on section appear succulent and pigmented. It might also be stated that the bacilli are found within these glands.

The kidneys and organs of the abdominal cavity appear normal, as do also the organs of the thoracic cavity.

A striking thing is the seeming lack of relation between the extent of the lesions and the violence of symptoms. Some animals may show a slight thickening on post mortem and have shown the most violent scouring before death. Bang states that he has seen cases where the animals have scoured violently, but after death nothing abnormal was found in the gross, it being necessary to resort to microscopical examinations to demonstrate the characteristic infiltration. On account of this lack of relation between lesions and symptoms, many investigators are of the opinion that bacterial intoxication plays an important role.

Methods of Diagnosis:—In a disease running such a chronic course, an early diagnosis is of vital importance. Dr. H. Markus in Holland published a paper in 1904, in which he states that he was able to diagnose several cases by cover-glass preparations of rectal scrapings from animals suffering with the disease (*Zeitschrift f. tiermedizin*, Vol. 8). He made rectal scrapings, stained smears and searched for acid-fast bacilli with a microscope. Bang also mentions this method (paper given at Ninth International Veterinary Congress, September, 1909). He used his thumb nail to pinch off parts of the mucous membrane. Mr. A. Meyer in Kolles' laboratory at Bern has been able to diagnose two-thirds of his cases by spreading the feces

out upon a flat plate and searching for particles of mucus. Stained cover-glass preparations revealed the bacilli. Bang states that he has tried this method in some cases with, and in other cases without results. These methods give results after symptoms appear, but a method far more valuable than these has been brought out in some recent work by Dr. O. Bang, of Copenhagen.

He first began experimenting in 1907 and the idea came to him to try the effect of tuberculin made from avian cultures, and has obtained some remarkable results. (*Centralblatt f. Bakt.*, I Abt., pp. 450-455). He found that animals suffering from Johne's disease did not react to ordinary tuberculin even in doses of 2 grammes, but that doses of from .75 to 2 grammes of avian tuberculin caused a distinct rise in temperature similar to that produced by ordinary tuberculin in tubercular cattle. He shows some very pretty reactions in his paper and states that they react in every way similar to tubercular cattle. They often show physical symptoms of scouring, shivering and loss of appetite some hours after injection. He has checked up these reactions and found the animals affected on post mortem. In some cases where the animals were badly affected, they failed to react, thus showing a similarity to tuberculosis.

To try this method Dr. Ravenel prepared a small amount of this tuberculin at the State Hygienic Laboratory at Madison, and a test was made upon a herd in Wisconsin in which the disease has been known to exist for at least ten years. This test gave four suspicious reactions and the animals were killed. Post-mortem examination showed nothing, and specimens were sent to the State Hygienic Laboratory for examination, but neither the bacilli nor the characteristic infiltration of epithelioid cells was found. The herd was retested this spring with one animal showing a reaction. The animal, however, is a very desirable one for breeding purposes, and has never shown any symptoms. She has been isolated and will drop a calf in the fall and will probably show symptoms at this time if she is affected. It was our intention to try this method more extensively

in the various herds in our state that are affected, but other duties have prevented. From our experience in Wisconsin I can say nothing for or against this method for the animals we killed gave only a slight rise in temperature (not enough to call a positive reaction) and the animal that has reacted is still alive and showing no symptoms of ill health. I might also state that in our first test a sufficiently large dose of avian tuberculin was not given as only .33 of a gramme of the Old Koch tuberculin (the ordinary dose of tuberculin used in testing cattle) being given, and Dr. Bang used doses ranging from .75 to 2 grammes. In the second test, however, a dose of 2 grammes were given, with one reactor, which is as I stated, still alive. From the reports in Dr. O. Bang's paper, it seems that this method is quite reliable, and we intend to do more work with avian tuberculin.

Treatment.—Therapeutic treatment of this disease has been of no avail. Since the scouring is of such an erratic nature in that it often lets up of itself without any medicinal treatment or change of food, it becomes impossible to determine the exact value of any given treatment. We can only hope to obtain beneficial results from such drugs that have a direct effect upon the causal organs, and as long as this organism has not been cultivated, we can hardly expect a rational therapeutic agent. Therapeutics, therefore, offer no solution to the problem, but since the infectiousness of the disease has been proven, it should receive treatment as such, namely, that of prophylaxis. The extent of the disease and its very unfavorable prognosis makes it apparent to everyone that measures for its prevention should be taken.

Owners of affected herds in Wisconsin have isolated the animals showing symptoms and keep a separate attendant for the affected animals and do not allow this attendant to visit barns in which healthy animals are kept until the suit he wears has been changed, his hands thoroughly washed and shoes disinfected. The manure from the affected cattle is hauled to fields which cattle never enter. A most careful method of scrubbing and disinfection with creolin and carbolic acid has been used in barns where affected animals have been kept. Two of these

owners tell me that they think they have about eradicated the disease from their herds by this method, but sufficient time has not as yet elapsed to venture any definite statement. One breeder states that he has lost fourteen head in the last twelve years, his last case dying about a year ago.

If avian tuberculin has the diagnostic value that Dr. O. Bang claims for it, it will be a mighty weapon in the war against this disease, for it will then be possible to diagnose the disease in its early stages and isolate reacting animals even before they show physical symptoms. It must be borne in mind, however, that tubercular animals will also react to injections of such large doses of avian tuberculin that the test should always be carried on in conjunction with the ordinary tuberculin test. The tuberculin test should first be applied and after two or three months have elapsed a test with avian tuberculin should be applied. If an animal reacts to both tests, we cannot be certain that she has Johne's disease, but we may be certain that she has either tuberculosis or Johne's disease. It may also be possible for an animal to have both tuberculosis and Johne's disease at the same time. These reacting animals could then be isolated under a system similar to the Bang Method for the Eradication of Tuberculosis.

REACTIONS GIVEN IN DR. BANG'S PAPER.

Temp. before Injection.	Temperatures next day.						
	9	11	13	15	17	19	21
101.6.....	104.3	104.7	104.7	105.8	104.1	103.6	105.8
101.8.....	104.5	104.1	103.8	100.9	100.6	103.2	102
101.6.....	104.1	103.8	104.1	103.8	104.3	103.4	102.2
101.6.....	101.3	102.3	102.2	104.3	105	102.8	101.6
100.9.....	104	104.1	103.2	101.8	101.6	102.3	
100.7.....	104.7	105.6	105	105.2	105.8	105.8	
101.1.....	102.9	104.1	104.1	103.2	103.2	102.5	
101.1.....	103.2	104.1	104.9	104	104.3	104.3	
101.1.....	102.3	103.8	103.8	103.8	103.2	102.5	
100.3.....	102.5	101.8	102	102.2	104	104.9	

TEMPERATURE RECORD OF THE REACTING ANIMAL FOUND IN WISCONSIN.

Temp. before Injection.	Temp. after Injection.						
	2	4	6 P. M.	7	9	11 A. M.	1 3 4 P. M.
101.4	101.2	101		101	103	102.6	103.2 104 102.4

THERAPEUTICS OF THE H-M-C COMPOUND AND ITS VALUE TO THE VETERINARIAN.*

BY JOHN LYNN LEONARD, D.V.M., SPENCER, N. Y.

One of the foremost requirements of the veterinarian is to relieve pain. This, of course, may be from a number of different causes. The most common trouble of this sort is colic in the horse. Then follow a few others, which, although important, need not be mentioned here. Next in line is the pain caused by operations. These are the two subjects, largely, on which I am going to speak.

For the former we have several good remedies, such as chloral hydrate, cannabis Indica, morphine, carminatives, etc., aside from the hypodermic purgatives. The most of these, however, have to be given by the mouth together with a pint or so of water. Even though they may work very nicely, when once gotten down, it is, nevertheless, a slow, tedious and uncertain process. Some animals are very good to take down medicine in this form, with the syringe, while others would rather die than to swallow a mouthful, and I have had those which I almost wished would, so that I would not have to bother any more with them.

One day as I was returning from a case of colic, which I had quieted down with chloral, I happened to have a pamphlet on the H-M-C Compound in my pocket. The drive was long and rather lonely, so I drew the paper out and looked it over. I noticed that the preparation was highly recommended for colic. I thought this would be a fine scheme if it would only work, and so sent for one bottle merely to try it.

This compound is put up in two sizes for the horse, namely Formula A and Formula B. Formula A is as follows:

Hyoscine Hydrobromide, gr. 1/10.

Morphine Hydrobromide, gr. 2½.

Cactin, gr. 10/67.

* Presented to the twenty-first annual meeting of the New York State Veterinary Medical Society, Ithaca, August, 1910.

Formula B is one-half the strength of Formula A and is the size most used.

In a few days a client came hurrying in and said that one of his horses had gotten into his seed rye, eaten a large amount, then drank some water and was then very sick. I hurried to his place and found the animal in very bad condition. I at once thought of my H-M-C's, but the case was so serious that I was afraid to use a preparation unknown to me in a circumstance where no time was to be lost, nor any experimenting done. However, I decided to chance it, and gave one of the full-sized tablets. To my great surprise, and also the owner's, in about ten minutes or less the animal was perfectly easy and eating hay, as though nothing had happened. A quart of raw linseed oil was then administered and the result was a complete and speedy recovery.

From this action I decided that the preparation was invaluable, and it has been my constant companion ever since.

Case after case of colic has since come under my charge, but the H-M-C has always been ready to do its task, and it has taken a pretty severe case not to be conquered by it in a very short time.

I have found this is not only good for colicky pains, but also for pain from other causes.

One night I was hurriedly called to see a driving mare which the owner thought had broken her leg, or strained herself badly. As soon as I arrived, I discovered that I had a very severe case of lymphangitis to deal with. The mare had a high fever, was panting and suffering great pain. The first thing that I did was to give her a hypodermic of H-M-C Formula B (half size). In a few minutes the animal was resting quietly, and in a sort of stupified condition. She was one of the peevish or "touchy" kind; so much so that she strongly objected to having the hypodermic needle introduced, and even tried to bite me while inserting it. Under the effects of the drug, however, she was a different horse. I could do anything I wished around her and it was alright, except that she would flinch when I touched the inflamed limb. The next step was to administer a good purgative

and a diuretic, and commence hot fomentations on the part, which were kept up until the trouble was relieved, together with the other usual treatment. During the whole night the mare rested quietly, and by morning the condition was so improved that no more anodyne was necessary.

Later on a case of intestinal catarrh came under my charge. A free passage had been obtained, but the animal, although in no great pain, apparently, was very restless and pawed almost continually. Occasionally he would lie down, but in a little while he would be up again repeating his former actions. I injected a Formula B tablet, and in about five minutes he was standing quietly. As the effects of the drug would wear off he would begin to get restless again. I was on the watch for these periods, and, when one dose was exhausted, would give him another to keep him easy. Never more than two doses in a day were necessary. In the meantime the treatment had consisted of soothing, laxative and anti-fermentative agents until recovery took place.

Along in the winter I had an obstetrical case in a cow, in which it was necessary to resort to embryotomy. The animal was quite restless, straining very hard and suffering a good deal. I gave her one of the full strength tablets to ease her, and also allow me to work to better advantage. In a short time she seemed greatly relieved and remained much quieter for some time.

Since then I inject a full strength tablet whenever I have a long job on my hands in obstetrical work. It does not stop the straining entirely, but modifies it to a large extent and causes the patient to behave much better, so that the veterinarian can work much more rapidly and easier. It also puts the animals in shape to stand the operation better, so that they have more strength left after it is through with, and can make a speedier recovery. I also use it in cases where the calf has been removed and the cow has a tendency to strain, and so cause danger of inversion of the uterus, or vagina. The drug is used in the town where I live by human physicians in their obstetrical work, as well as to quiet

pain, or restlessness from any cause, and they think there is nothing like it for those purposes.

I noticed in the pamphlet that the compound was a direct antidote for strychnine. I was just nicely getting anxious to give it a trial in that line, when one day I was favored with a case. A valuable two-year-old heifer had been given an overdose of strychnine to brace her up after a hard struggle at calving. She lay on the barn floor stretched out on her side, and having one spasm after another. The least noise, or slight touching of her, would cause her to jump nearly clean from the floor. Heavy blue clouds hung all around and the owner, too, was having spasms, but of a different nature. As soon as possible I injected a tablet of Formula A. In about ten minutes she was greatly improved. I waited a few minutes, and then gave her another tablet of the same size. In about half an hour she seemed entirely free from the spasms and endeavored to get up. With a little help, she accomplished this, and was soon licking her calf and appearing perfectly natural.

Several veterinarians have reported excellent results in cases of strychnine poisoning in the dog. Although I have not yet been so fortunate as to be able to try it in this case myself, I am positive that it will work alright.

Another favorite use of the compound with me is in operative work on the dog, especially in bitch spaying. For these animals the regular human size tablets are used. They are put up in two sizes, called respectively No. 1 and No. 2. No 1 is as follows:

Hyoscine hydrobromide, gr. 1/100.

Morphine hydrobromide, gr. 1/4.

Cactin, gr. 1/67.

This is one-tenth the strength of Formula A, the horse size.

No. 2 is one-half the size of No. 1, hence is called the "Half Strength" tablet.

I do not use the half strength tablets at all, except on my very smallest dog patients, and even then rarely, as the compound can be used much more freely on dogs than is generally supposed. This I found from personal experience.

While in college we used to use a full strength tablet for medium sized dogs. In about twenty to thirty minutes we would place the patient on the table and give an anæsthetic composed of two parts ether and one part chloroform. In a very few minutes, and only having to use but a little of this mixture, we had very good general anæsthesia, and the dog would sleep for an hour or more after the operation. This seemed to me a marvelous advance over the old way of using ether alone, as you all know how hard it is sometimes to get a dog under the influence of ether, and when you once get him there, he will come out of it very readily, so that it is necessary to keep administering it continually throughout the operation. Chloroform alone requires an expert to administer it, or death will result from a trifle of an overdose. Either of these, of course, requires an assistant in order that the operator may safely and rapidly do his work.

Far still was this process ahead of the old time method of strapping a bitch down, or hanging her up by her heels, and going at her in a butcher fashion, which, I am very sorry to say in this day and age, is still practiced by many veterinarians.

With the H-M-C preparation there is no excuse whatever for operating on dogs without an anæsthetic, except in very, very rare cases.

Before starting out for myself to use the compound in operative work, I was informed that it could be used with perfect safety in much larger doses in dogs. So, on my next case in spaying, a bitch weighing about thirty-five pounds, I gave two of the full strength tablets. In about half an hour she was quite drowsy and heedless of her surroundings. I waited another half hour and then placed her on the table. A little of ether-chloroform mixture, previously mentioned, was administered by an M. D. friend of mine, and complete anæsthesia soon resulted and lasted during the entire operation with the occasional addition of a few drops of the liquid anæsthetic. When removed from the table and started for home in a wagon, the bitch was still sleeping. A very good recovery occurred.

I was very well satisfied with a result of this kind and used the preparation in this proportion for some time.

After a while I decided that I would increase the dose of the H-M-C. This patient was a young collie bitch, weighing about thirty pounds. I gave her three of the full strength tablets. In the meantime, while I was waiting for it to act, I set about sterilizing my instruments, mixing up the ether and chloroform, etc., preparatory to the operation. In about three-quarters of an hour I thought she must be ready. I went out in the yard to get her and found her lying on her side, apparently dead to the world. I carried her in, shaved the field of operation and placed her upon the table. A neighbor veterinarian was assisting me with the work. I placed some of the ether-chloroform mixture to her nose and told him to hold it there and use his own judgment as to giving it. I looked at the bitch again and then pulled it away, fearing to give her any, as she seemed to be so sound asleep. I told him to keep watch of her and give it as she needed, and I would go ahead with the operation. I made the incision through the skin, but the bitch did not seem to mind it. I then continued the operation and completed it, even to washing up afterwards, without a single drop of the ether-chloroform mixture, yet having complete anaesthesia. After being removed from the table she slept for some time, and then awoke, gradually gained her strength and equilibrium and was up trotting around as though she had never had an operation.

My next case I treated in the same way. I was a little slow in getting ready for her, and she seemed a little livelier than I really liked when placed upon the table, so I gave her another full strength tablet. This soon quieted her down, and I went on with the operation as in the preceding case. She made a very good recovery, and in a few days was able to be shipped south.

Since then my chloroform and ether bill for dog operations has been very light. In fact, although I always have it ready, I never use it. If my patient is not under it sufficiently to suit me, I give her enough more of the compound so that she is.

I was called one morning to see a fox terrier, which I found to be suffering from meningitis. He was very old, and so serious that I advised destroying. The owner gladly consented. I gave him two full strength tablets and soon had him sleeping. I then administered clear chloroform to him and the little fellow was soon out of his misery without a struggle, much to the satisfaction of his owner, who was the superintendent of the Humane Society, and very much opposed to animal suffering.

This preparation has five distinct advantages:

First—You get complete general anaesthesia, and the patient sleeps for some time after the operation, thus giving the owner a chance to get home before it wakes up.

Second—No skilled assistant is necessary, which is of great value, especially to the country practitioner.

Third—Vomition nearly always occurs, and usually urination and defecation in a few minutes after injection, thus emptying the stomach, bladder and rectum, and greatly facilitating the work of the operation.

Fourth—There are no bad after-effects following the use of the compound.

Fifth—It is inexpensive compared with chloroform and ether.

It is a most excellent agent for relieving pain of any sort in the dog, and works much nicer than plain morphine, or morphine and atropine.

In the cat, however, it is contra-indicated, as even a small dose acts like morphine in this animal, causing delirium, which is very marked, and lasting a number of hours. I myself have only tried it but once on the cat, and as the small boy said when about to be punished, "I'll never do it again."

As a general anaesthetic it does not work the same in the horse as in the dog. It fails to produce complete insensibility. A report of experimental work done in one of the Western colleges states that they were successful by combining it with chloral. I have not tried anything of this sort myself, and so am not in a position to talk on it.

In the ordinary cases of colic or other mild or medium cases of pain in the horse, I use one tablet of Formula B. This usually is sufficient to ease the patient in a very few minutes. If the case is quite severe I use a tablet of Formula A, which is just twice the strength of Formula B. In case I get little relief from the first dose, I repeat it in twenty to thirty minutes. As soon as I get my patient quiet, I give a good purgative to remove the cause of the trouble.

DR. E. P. BARNHART, B.A.I., has recently been transferred from field work in Salt Lake City to post-mortem work in Cleveland, Ohio.

DR. ARCHER E. PARRY, of New York City, officiated in the capacity of veterinarian to the U. S. army horses at the National Horse Show in Madison Square Garden in November, having been temporarily appointed for the Department of the East.

THE Veterinary Session of the Cleveland Academy of Medicine has reconvened for the winter sessions and expects to have some interesting and profitable papers presented at their several meetings. This active body has appointed a legislative committee to take care of matters relative to the practice of veterinary medicine in the State of Ohio.

WE are recently in receipt of *Bulletin No. 17*, issued by Commissioner Pearson of the State Department of Agriculture, entitled, "A Partial List of Owners of Pure-Bred Live Stock in New York State." It covers most of the breeders and owners of pure-bred live stock in New York State in 1910, the kind of live stock and the number owned in each case. In one part of his introductory statement Commissioner Pearson says: "New York State justly may be called the home of several of the chief breeds. Altogether there are here recorded 65,962 pure-bred animals of all kinds owned by approximately 4,706 persons." It is a most instructive little bulletin of about fifty pages, and should do much to encourage the breeding of pure-bred animals in the Empire State.

OBSERVATIONS ON BURSATTI.*

BY CHESTER L. ROADHOUSE, D.V.M., BERKELEY, CALIF.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

During the past summer the Agricultural Experiment Station of the University of California has conducted investigations of animal diseases in the Imperial Valley, California. Of the various diseases reported, bursatti (summer sore) proved to be the most important for the reason: first, that considering the size of the valley there were many cases, and second, that no particular treatment had proved satisfactory.

The Imperial Valley itself is of interest from the fact that a large part of it is below the level of the sea. The Colorado River carrying to its mouth great quantities of salt deposit has filled up the Gulf of California at the point where the river empties so that the northern part of what was once the Gulf of California and which was once connected with the waters of the Pacific Ocean, is now what is known as the fertile valley of Imperial. Previous to the introduction of irrigation this was an absolute desert.

The term "bursatti" is derived from the Indian word, "Burat," meaning *rain*. The term literally means *rainsore*. The annual rainfall in the Imperial Valley is less than four inches, and there is no rain whatever between the months of June and October, the period during which the disease develops.

Practically all of the livestock in this valley drink from settling basins where the water is allowed to stand until the sediment separates from the water, leaving it clear. Horses and

* Presented at the forty-seventh annual meeting of the American Veterinary Medical Association, San Francisco, Cal., September, 1910.

cattle frequently are allowed access to these settling basins, where they stand for hours during hot weather. Fungi and insects of various kinds thrive in these settling basins, when the water is not changed frequently.

The climate in the Imperial Valley is very hot during July and August and there is considerable moisture in the air from the extensive irrigation of the land. I mention these facts to bring out the possible influence, which these conditions may have in relation to the cases of the disease which I shall mention. Since 1904, twenty-one cases of this disease have developed in the Imperial Valley. The ages of the animals affected varied from nine months to twenty-five years. The lesions were located at the following points: breast, lumbar region, abdomen, side of face, prepuce, mammae, front of forearm, legs below the knees and the fetlocks. The legs below the knees and hocks and lower parts of the body suffer most frequently.

In all of these cases the animals were allowed free access to standing water, which in many cases was stagnant, covered with fungi and filled with insects of various kinds. Some of the animals that developed the disease had stood with the water reaching to the body during the hot part of the day. On one ranch three cases developed in one season and one case had developed the previous year. Another ranch developed three cases the same year, and there are other ranches from which two cases are reported. My observations were confined to four animals.

CASE No. 1.—Mule, 25 years old, was in fair flesh; developed the disease June 1, 1910, and was brought to me for treatment on June 7th. The lesion was located on the breast.

Symptoms: Lesions.—There was considerable local swelling and thickening of the skin and the tissues immediately beneath. This swelling, well-circumscribed, extended over an area of about 6 inches by 8 inches. In the center of the swelling was a fistula one-half inch in diameter, which drained a necrotic area extending about 2 inches into the tissues and turning almost at right angles and continuing about 3 inches further beneath the skin and subcutaneous tissue. The hair was falling out over a small

area surrounding the opening of the fistula and a yellowish, watery fluid, sometimes resembling bloodstained serum, and which is characteristic of bursatti, exuded from the wound drop by drop, slowly but continually. This fluid was later seen to be secreted only from the granulating tissue.

Treatment.—Operated immediately, removing a section of tissue 4 inches by 6 inches and $2\frac{1}{2}$ inches deep, which included most of the swollen, thickened tissue around the wound and all tissue which had an unhealthy appearance. Within a week excessive granulating tissue had developed at two points within the wound. This tissue continued to grow and spread rapidly despite the following treatment: Washed thoroughly once daily with 3 per cent. solution of carbolic acid, followed by covering the wound thoroughly with dusting powder composed of boracic acid, salicylic acid, acetanilid and iodoform. Carbolic acid and salicylic acid have been recommended for use in this disease, as they destroy fungi readily, and the disease was reported by Fish* and Bitting† to be caused by a fungus found locally in the lesions. After one week, lysol was substituted for the carbolic acid, and with the dusting powder was continued throughout the treatment. The wound was covered completely with antiseptic cotton held in place by a bandage passed around the body of the animal. This was necessary to keep the flies from the wound.

When this treatment failed to check the excessive granulation and watery discharge, formaldehyde, full strength, was used on the surface and injected into the base of the rapidly granulating tissue with a hypodermic syringe. The formaldehyde caused the animal some discomfort, but the following day the serum discharge was entirely stopped and the granulating tissue dark colored, and usually by the third day the dead tissue had sloughed off, leaving a healthy appearing surface with no discharge. Although the full strength formaldehyde was used, I believe that it would produce good results if used diluted, say a

* P. A. Fish, Leeches. Twelfth and Thirteenth Annual Reports, Bureau of Animal Industry, pp. 229-239, 1895-1896.

† A. W. Bitting, Leeches or Leeching. Annual Report, Florida Agricultural Experiment Station, 1893. Bulletin No. 24.

10 per cent. solution. The treatment was continued in this way, using the formaldehyde whenever it was necessary to check the excessive granulations. The animal remained in good condition throughout the treatment with good appetite and normal temperature. Attempts to bite the wound were noticed only once, when the bandage had loosened and dirt and flies had come in contact with the wound. A letter from the Imperial Valley, dated September 3d, reports this mule completely recovered and back at work. The recovery has taken place during the hottest weather.

CASE No. 2.—Large sorrel horse, 8 years old, in good flesh. Was affected with this disease in 1909. Recovered at the advent of cool weather. June 25, 1910, the surface of the scar caused by the disease in 1909 had cracked and was discharging a yellowish, watery fluid. There was no swelling around the lesion. I was not able to diagnose this case positively, although the discharge was characteristic of bursatti. I filled the wound with formaldehyde as before, which stopped the discharge only temporarily. Four days later a second application of the formaldehyde stopped the discharge entirely and it did not recur. And no further trouble has resulted.

CASE No. 3.—Nine-months-old colt, developed the disease in September, 1909. The animal had stood in water up to its body a great deal of the time. Extensive lesion over lower part of abdomen, covering a surface 18 by 10 inches. The animal recovered temporarily February 1, 1910, but broke out again in July, affecting the sides and lower part of the abdomen and the prepuce. This animal was not treated by me.

CASE No. 4.—Black horse, about 8 years old, in good flesh. Had suffered from the disease during the summers of 1908, 1909, and again this past summer. Sent to University Experiment Station. The disease had been in progress several months. Lesion located on the left side of face, was secreting the characteristic yellow fluid. Lesions also attacking right foreleg at two points below the fetlock, which showed the development of the characteristic granular deposits. The object in this case was to

determine the effect of the cool coast climate on the course of the disease without further treatment except to protect the lesions at the fetlock by means of a gauze bandage.

Within a week the watery discharge from the lesion on the side of the face had ceased, and by the end of the second week, the necrotic granules had disappeared from the lesions at the fetlock, leaving a smooth, raw surface. A slight watery discharge reappeared from the lesion on the face for a few days when hot weather developed, but soon disappeared, and the lesions are gradually healing.

In the *Review of Recent Facts in Tropical Medicine*, Wellcome Research Laboratory*, Khartoum, reference is made to the disease as a strange complaint associated with the presence of filaria embryos in the skin and connective tissues of horses, which is common in India. Lingard concluded from a number of observations made in the Muktesar laboratory on horses and cattle, that the filaria embryos are present in the blood of affected animals in varying numbers during the twenty-four hours, and that between 6 o'clock and 10 o'clock in the evening the number of these embryos increases enormously. They were fewer during the month of September than they were during the months of June and July.

The filaria irritans is reported from Europe as being the cause of the disease bursatti, and the embryos are reported to have been found in the circulating blood.

In America the filaria embryos have not been reported as having been found present in the blood or within the tissues of the lesions of animals suffering with this disease.

With a view of determining the presence of these filaria embryos, microscopic examinations of the blood of cases Nos. 1 and 4 were made. Wright's stain was used in the preparation of the blood smears.

CASE NO. 1.—Number of blood smears examined, 50. Number of fresh cover glass preparations examined for motility, 20.

* *Review of Recent Advances in Tropical Medicine*. Supplement to Third Report, Wellcome Research Laboratory, Khartoum, page 219.

CASE No. 4.—Number of blood smears examined, 30. Number of fresh cover glass preparations examined for motility, 10.

Professor Herms of the Entomological Department of the University of California, assisted me in the examination of slides for the presence of filaria, and in no case did we find the embryos present.

Blood examinations of Case No. 4 showed the following:

Red blood corpuscles, per c. m., 8,008,000.

Leucocytes, 16,200.

Hemoglobin, 100 per cent.

Eosinophiles, 10 per cent. in proportion to the total number of leucocytes.

The number of leucocytes present in Case No. 4 was increased about 10,000 per c. m. above the normal. The increase in the number of eosinophiles was marked, and instead of about 4 per cent. as reported by Moore, Haring and Cady, for normal horses*, 1 per cent. of eosinophiles were found in this animal.

Microscopic examinations of sections from the borders of the lesion from which the watery discharge is secreted were made by the pathologist at the Cooper Medical College, San Francisco, and showed the lesion to be of a rapidly granulating type containing an increased number of eosinophiles.

I realize the need for further investigation on this disease in this country. The Agricultural Experiment Station of the University of California shall continue observations on Case No. 4, with a view of bringing about a recurrence of the disease by taking the animal to a hotter section of the state at the beginning of the next summer. Further observations will be made relative to this and other cases at that time.

In conclusion I would say: 1. That we were successful in treating bursatti by excising the diseased tissues as completely as possible, followed by the application of antiseptic solutions and dusting powders.

* Proceedings of the American Veterinary Medical Association, 1904, p. 288.

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2. That strong solutions of formaldehyde prove effective in checking the secretions and excessive granulations, without noticeable ill effects to the animal.
 3. That animals suffering with extensive forms of the disease can be treated more successfully by removing them to cool climates where the disease is not apt to recur.
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THE UNITED STATES LIVE STOCK SANITARY ASSOCIATION will hold its fourteenth annual meeting at the Grand Pacific Hotel, Chicago, December 5, 6 and 7. A program rich in scientific thought from the leading sanitarians of the country, including laymen, physicians and veterinarians, has been prepared.

IN forwarding the minutes of the January, 1910, meeting of the Iowa Veterinary Association to the REVIEW for publication during the month of November, Secretary Simpson explained that he had prepared and mailed a set of minutes to the REVIEW right after the meeting in January last, and only recently discovered that they had been destroyed by an accident at the time of mailing.

ANOTHER strong veterinary organization has sprung into existence in New York State, known as the Central New York Veterinary Medical Association, with the following earnest supporters of the old State Society as charter members: W. G. Hollingworth, H. A. Turner, W. B. Switzer, F. E. York, J. A. Pendergast, Wilson Huff, L. G. Moore, D. C. Papworth, E. E. Cole, A. J. Tuxill, J. G. Hill, V. G. Kimball, E. E. Dooling, J. M. Currie, Geo. Gowland, Frank Morrow. Its territory comprises the counties of Seneca, Cayuga, Oswego, Onondaga, Jefferson, Lewis, Herkimer, Oneida, Madison and Cortland. The officers for the ensuing year are: Dr. W. G. Hollingworth, President, Utica, N. Y.; Dr. H. A. Turner, Vice-President, Syracuse, N. Y., and Dr. W. B. Switzer, Secretary and Treasurer, Oswego, N. Y. Meetings will be held in June and November, at Syracuse. The first meeting was held November 25, last, with a very creditable program. The Empire State has enjoyed the reputation of having the hardest working state veterinary organization of any of the states, and with this added opportunity for its veterinarians to work off their energy, much should be accomplished for the profession. The REVIEW offers its congratulations.

THE NECESSITY OF PROPER TRANSPORTATION IN THE PRODUCTION OF A SANITARY MILK SUPPLY.*

BY DR. C. A. DUKES, OAKLAND, CAL., PRESIDENT, OAKLAND BOARD OF HEALTH.

In considering the various steps in the production of a sanitary milk supply it must be conceded that one of the most important features is that of transportation. It can be readily understood that no matter how carefully milk may be handled by producer or dealer if during transit from the farm to the City it does not receive the attention and care it deserves, all precautions in other directions are practically nulled.

By correspondence with various sanitary authorities throughout the United States we have learned that with a few exceptions little systematic work has been done towards securing proper transportation of the milk supply of large cities.

In cities of 100,000 inhabitants or more the problem of milk transportation is fast becoming a vital one for several reasons.

In the first place dairy farms that were formerly operated within a teaming radius have been crowded farther away owing to the fact that land in the vicinity of such centers of civilization has become too valuable for dairy purposes.

Second, and this perhaps more particularly applies to communities located on the Pacific Coast, dairy farmers have come to a realization of the fact that in order to operate a dairy successfully and at a profit the farm must be located where an abundant supply of food stuffs can be readily obtained.

To properly supply dairies with food stuffs bringing same from distant valleys to within easy transportation to the large cities has increased the cost of food stuffs to such an extent that the production of milk and milk products under such circumstances is almost prohibitive.

It is obviously much less expensive to transport milk from locations where food stuffs may be produced in abundance than

* Presented to the American Veterinary Medical Association, San Francisco, September, 1910.

it is to transport such food stuffs to within easy teaming distance of places where milk is consumed.

These reasons above all others have been the means of forcing the dairy farmer to seek locations at such distances from the point of consumption where reliance must be placed upon the railroads for the delivery of their product.

Climate is often an important factor. At least it must be considered so as regards conditions existing on the Pacific Slope. It is a well known fact that cows are more productive and consequently more profitable when maintained in interior localities than they are when kept in the immediate vicinity of the cities on the coast.

Until very recently little or no attempts have been made by railroads to provide adequate facilities and service which will insure the delivery of milk in as good a condition, practically speaking, as when it is intrusted to their care.

Unfortunately railroads are more prone to consider as more important the revenue to be derived at the least inconvenience to their schedules and the observation of union rules as regards the accommodation of their employees. It is quite evident that the railroads consider these matters of infinitely more moment than the necessity of proper service in the matter of transporting milk so that it will reach the consumer in a wholesome condition.

To illustrate this point we shall quote one incident in regard to the shipment of milk into the city of Oakland. Some little time ago complaint was made that the milk service on a certain road was such that milk reached the consumer after a great deal of unnecessary delay. Upon investigation it was learned that a certain train used for milk purposes was running so close to the union schedule for the accommodation of its employees, that it left no margin to come and go on. As a consequence, should it get slightly behind its schedule, milk was frequently carried past the Oakland station, and was carried to the terminus at the Oakland Mole, from where it had to be re-shipped back to its proper destination, which it reached eventually, but after having been belated for several hours under conditions that did not favor

its sanitary condition. It is true that when the matter was called to the attention of the road referred to, and when it was suggested that by changing its schedules so that the train in question could be started at the other end of the run fifteen minutes earlier, the difficulty was overcome, but this required about three months to accomplish the desired results.

Then again milk tanks in many instances are piled indiscriminately into express or baggage cars, the doors of which are kept wide open all the time. Here they are infrequently stored amongst undressed veal, poultry coops and various other farm products and merchandise, and now and then a human cadaver in a redwood box is also placed among the heterogeneous mass, constituting a most unfavorable environment.

Too often the employees of the railroad along the right of way obtain their daily milk supply from tanks so shipped, and as they take the milk at the top of the tank and observe no sanitary precautions during the operation, the subsequent condition of the milk either from a food value or sanitary standpoint can hardly be said to be improved.

Another feature is the transportation of empty tanks back to the producer. This is usually done at the convenience of the railroad, which often displays supreme indifference as to the time and manner in which it is done. Frequently tanks are shipped back to the country in cars from which live stock have recently been unloaded, or if shipped in express or baggage cars are kicked off at their destination, which is perhaps some small station where the train crew do not desire to stop. As a consequence a string of cans is formed along the road, the length of which depends entirely upon the number of tanks and the rapidity with which the train is moving. This practice does not, as can readily be imagined, add to the sanitary possibilities of the tanks or their usefulness as milk containers.

Railroads are quick to raise the issue that there is not enough profit in the milk business to justify better service, but an investigation of the amount of traffic along these lines will reveal the fact that the revenue derived from this source cannot be con-

sidered a negligible quantity. And even if it were so, it is not a good and sufficient argument that such a vital and important food product should receive irreparable injury through the fact that it has to be transported under unfavorable conditions in order to keep the cost of same within the limits of the ideas of the interested parties.

We believe a railroad should derive a fair profit from the handling of milk and milk products and in fixing its rates it should refuse to accept consignments at such rates as would preclude the possibility of caring for the same in a proper sanitary manner.

Proper cooling of cars in the summer time and running milk trains on a schedule that will meet the necessities of milk producers should be the aim and object of every railroad operating in and through dairy districts. In this connection the producers and dealers should recognize their responsibilities in the premises and should co-operate by seeing that milk is delivered and received without such delay as will necessitate milk tanks remaining on exposed platforms under unfavorable sanitary conditions for indefinite periods of time.

In conclusion we believe that if representatives of dairy organizations and sanitary authorities would agree upon certain rules governing the transportation of milk, there would not be much difficulty in demonstrating to the railroads the necessity of putting such rules into effect.

But until some such general movement is made and the parties interested come together and work for the common good, efforts along these lines must of necessity be of a sporadic nature and of little avail.

Possibly the solution of the transportation problem may be more quickly solved by establishing municipal dairies, as has been suggested by a popular magazine. Surely it is as necessary that the milk supply should be as pure as we demand of the water supply, and I shall recommend that the city of Oakland, which is about to adopt the commission form of government, give this early consideration.

MY EXPERIENCE WITH CHOKING ANIMALS.*

By J. A. McCrank, PLATTSBURGH, N. Y.

Oesophageal obstructions or choke, is an accident, a malady or whatever you may wish to call it, that has often caused me much worry and no small amount of hard labor.

I have treated case after case of this kind with various degrees of success, following the different lines of treatment as laid down by various practitioners and veterinary writers in periodicals and text books. After many failures and not a few blunders, I have finally adopted a course of treatment which I will describe in this paper.

For the sake of brevity, I will omit the physiological and anatomical construction of the organs involved and proceed with my subject proper.

In pharyngeal obstructions I never have any amount of trouble in relieving my patients, and I have treated large and small. In the dog and cat a pair of forceps will always remove the obstruction, while in the cow or horse the hand is passed to the pharynx and the object is removed.

In cervical chokes I have had but two cases in the dog, the one a bone and the other a lady's thimble. In both cases I performed œsophagotomy with success. For after treatment I merely subjected the little fellows to three days' starvation, then began with small quantities of milk.

In the cow I have had but one case of cervical choke that I could not remove by outward manipulation. In that case I performed œsophagotomy after trying every other described treatment. The result was fatal. The owner *would* feed and the cow being hungry *would* eat. The solid food lodged at the seat of operation was forced through the wound among the muscles, the wound became infected and the patient died.

* Read before the twenty-first annual meeting of the N. Y. S. V. M. S., Ithaca, Aug., 1910.

In horses I have never been successful in relieving cervical chokes by external manipulations, and here is where I have had my troubles. And if this were a social hour, I believe I could entertain you by relating the various treatments of chokes, with accounts of my successes and my failures, but more especially the latter.

I performed oesophagotomy three times, when I retired from the field of surgery. Case I. was a feed choke; tried every other treatment before I operated. After operating I found out I was surgeon, nurse, swipe and stable boy, to maintain a social (undignified) standing in the section. My patient recovered in less than three weeks, a scientific success, but a financial and social failure. Case II.: After operating for same kind of choke, I withheld my services as swipe and nurse for four days, when I found I was obliged to fall in if I did not want my patient to die. The result was a success but another financial disaster. Case III.: I obliged the owner to supply the places above mentioned, for I could not afford to sacrifice my all for a trivial success; well, my patient died.

After that I used every other describable means to relieve chokes. I relieved a few and quite a few died from various after results as mechanical pneumonia, infected wounds of pharynx and oesophagus and once tetanus. The harder I labored the worse seemed the results; and I believe this will follow every man's effort if directed as mine were.

My lesson came. Dr. Smith's mare "Kelpie" was found choking in the lot one night, supposed to be an apple. I was called. I used the probang, I used oil, I used oil and warm water, external manipulations, but all without success. Then the doctor wanted to operate, but guided by the past I cast about for an excuse to refuse. Being now about 11 p. m., and there was but one lantern in the barn and no help, we agreed to postpone operating until morning. Hoping the animal would either recover or die before morning, I went home. Early morning brought me an urgent call to the country. When I returned "Kelpie" was out ploughing and Dr. Smith was undecided

whether to be angry or not, but a truthful explanation saved my client and my patient was saved. A second case of this kind was similarly treated with like results. Enough for cervical chokes.

In cows I have treated many thoracic chokes, though few compared with cervical, and have varying successes, some favorable, others different. I have often ordered slaughter to avoid a total loss. It was then I was ashamed of myself, because I could not save the man's property.

Some years ago a Mr. Mousso called me to relieve a choking cow; thoracic choke, a turnip. After a few trials I advised slaughter, for the animal was good beef. I punctured to relieve tympany, while Mr. M. went to the city for a butcher to come out and kill. Owing to the lateness of the hour, the butcher would not come. I left the canula in place and came home. In the morning the cow was better. Since then I have had a chance to try the same treatment a few times with success; in fact I have tried no other.

Treatment.—In horses suffering from cervical or thoracic obstructions, I place my patient in a stall, away from noise and visitors; place a bucket of water in the manger and leave him. I have relief in six hours, nine hours and sometimes twelve hours, but I always have relief. In cows with thoracic choke, if much tympany present, I tap the patient, leaving the canula in situ and leave her to quietness, and I meet with the effect desired.

Now this paper may not meet with the approval of every one, especially the surgeon who has all conveniences, which I have not, and practical men who will not reveal the results of their years of experience, but when it comes to a scattered country practice where proper help and appliances are not to be had, then I believe a great many more patients will be saved by my treatment than by using the knife and other heroic measures, and you are not subjecting yourself to such tedious labor and work. And above all, your fee will be more in proportion to your labor than if you operate.

PARTURIENT PALSY.*

By A. E. ROBERTSON, M.D.V., NASHVILLE, TENN.

On being asked by one of the members of the association to compose and read a paper on some subject before the Second Annual Meeting of the Tennessee Veterinary Medical Association, I began to cast about for a subject that would be of interest to all present. It is possible though that the one I have chosen might not be of interest to some of the older practitioners. Each member present knows very well that a young vet. with a limited amount of experience is hardly capable of interesting an assembly of men whose field of practice has been so extensive; nevertheless I will do my best, and look forward with pleasure to the time when I will have had more experience and be able to write a more interesting paper.

No doubt you have already noticed in the program where I am down for a paper on "Hematuria in Foals," but after learning that one of my classmates was down for the same subject, and knowing his ability as a practitioner and scholar, so in order to avoid embarrassment to myself and keep down competitive strife have decided to select some other subject, namely, "Parturient Palsy or Dropping After Calving."

Have decided on this subject because I have seen more of this trouble in the past three years than any other disease or ailment. There is very little literature to be found on this subject, thereby making it very difficult for a young practitioner to recognize. It is sometimes closely allied to other conditions met with in bovine practice, especially parturient paresis.

On July 15th I was called to see a cow, which I inferred from symptom described over the 'phone, was suffering with "Milk Fever." Upon arriving on the grounds secured the following history and symptoms: Plethoric animal, third or fourth calf,

* Read before the Tennessee Veterinary Medical Association, Nashville, Nov. 4, 1910.

had been on rich pasture, owner reported an easy birth, cow about one-half Jersey, calf twenty-four hours old, temperature of cow 103, accumulation of urine and faeces, pupil and corneal reflexes were not disturbed, animal able to rise but very weak and tottering in walk. The pupil and corneal reflexes were the only negative symptoms of milk fever. I at once cleaned rectum, drew urine and injected one-half gr. strychnine sulphate, drenched with 1½ pounds magnesium sulphate plus one-half pound sodium chloride, then applied sinapism to loins and then left patient for the night. Upon returning next morning found symptoms all aggravated. I tapped the rumen and to make sure it was not milk fever, I injected the udder. The patient died in the afternoon.

About two weeks following was called to see another case with the identical same symptoms with the exceptions of a slightly dilated pupil, corneal reflexes were slightly absent, cow was about three-fourths Jersey and was less able to support herself while standing than the other patient.

I mention these cases because the symptoms were so similar and yet entirely different conditions. This trouble may be a sequel of paralysis of the posterior extremities due to carrying of large foetuses.

I will now endeavor to give symptoms as I have observed them. It may or may not be associated with poor nutrition, have seen more cases in well nourished animals than poorly nourished. As a rule the animal is found in a recumbent position. Dr. McKinzie, of McKillip's Veterinary College, says they are unable to rise, but I have never seen a case that the animal was not able to rise and get up on its feet; of course they would stagger some in walking. Twelve to twenty-four hours before death the animals are never able to get up. Other symptoms are an increased pulse rate and accumulation of urine and faeces; these together with a history of a large calf constitutes the symptoms. About fifty per cent. of the patients succumb to the trouble.

Treatment consists of stimulants, cathartics and sinapisms to loins.

REPORTS OF CASES.

CLINICAL RESULTS WITH BACTERIAL VACCINE.

By F. E. Barnes, D.V.S., Waxahachie, Texas.

In submitting this report of ten cases treated with *Bacterial Vaccine*, I will first refer to some of the advantages it possesses over surgical and medicinal treatment, which with me have given very indifferent results. One of my difficulties heretofore has been in making my patrons do *their* part of the work; now I refuse to treat one unless it is prevented from rolling and tied so that it cannot rub. I believe that in these bacterial vaccines we have a successful remedial agent for all suppurating conditions; and I include poll-evil, fistula, quittors, etc. In poll-evil it usually takes longer, due, I believe to the lack of blood in these parts. The first ten cases I have treated follow; one c. c. was given as an average dose, five days apart:

CASE No. 1.—Large bay mare; fistula of both withers; right side open; swellings large and of four months' standing. Gave one c. c. of anti-supuration vaccine every fifth day, and four is all she received. Cured.

CASE No. 2.—Bay mule, 15 hands; both withers; discharge from both sides; secured drainage. Cured with three injections, but owner wanted to be sure and took two extra. Has worked animal with collar since a week after last injection.

CASE No. 3.—Poll-evil; badly swollen; no drainage; received six injections, five days apart. Swelling gone; looks to be sound and well at this writing.

CASE No. 4.—Quittor; right fore foot; had been discharging pus for two months or more; kept clean with peroxide every other day, with dusting powder and bandage for fifteen days, during which time he received three injections. A shoe and pad were then put on and he is now working. No lameness. No discharge after second injection.

CASE No. 5.—Small black pony; had flatulent colic and was tapped by an empiric. A week later I was called to treat the abscess. Cleansed well with peroxide; gave two c. c. at one in-

jection; went to work in five days with not even the hole showing.

CASE No. 6.—A cow with septic-metritis; farmer removed the placenta with all the neighbors' help and advice; result, several small cavities in wall that felt like abscesses; thick, stringy, pus-discharge daily. Removed a good handful from uterus and washed thoroughly with a permanganate solution and gave 3 c. c. at one dose. After four days the discharge had stopped; appetite returned and she seems sound and well now. Owner said she had been discharging two weeks when he called me.

CASE No. 7.—Bay mare; moderate swelling of withers; swelling entirely gone after receiving four doses of one c. c. each. Now at work every day.

CASE No. 8.—Poll-evil; mule; four months' standing; has received seven injections to date, but owner refuses to keep animal from work and it is impossible to get good drainage. One more treatment ought to suffice.

CASE No. 9.—Valuable bay mare; shot through scapula, ranging downward, hit fifth rib, glanced downward and outward, lodging in muscles in region of shoulder joint. Had been discharging pus through the hole in scapula for nearly two months. Owner had kept it open by jamming a good sized spike through it daily. Tapped with long trocar from depression above elbow joint upward and anteriorally and got nearly a quart of pus; this gave drainage above and below. Gave three injections of two c. c. each, peroxide one-half, water one-half, injected through hole in scapula daily for two weeks; discharge has stopped; swelling is nearly down and is walking on leg after carrying it all summer.

CASE No. 10.—Brown horse; fistula right side; one year's standing; open and as large as a bucket; used seaton and has received two injections; swelling reduced one-half to date and doing nicely.

I use Camphalum (P. D.) dusted over part daily to keep flies away as they are very bad here, and that has surplanted all my blisters, etc. I have now a case that I operated on a week ago that is of three years' standing and is nearly a foot forward from the withers, caused by the neck strap of a breeding halter, runs on both sides, or did until I cut a hole through large enough for one's fist, just above the fifth cervical vertebra, and removed the necrossed top of it. Did not use the anti-suppuration vaccine until yesterday.

TENOTOMY OF ANTERIOR LIMBS.

By Dr. G. U. MARCHAND, Urichsville, Ohio.

Fig. I. shows condition of colt before the operation, August 23d, colt then four weeks old. Fig. II. shows colt's condition six days after operation, August 29th. The history of the case as related by the owner pointed out the fact that the colt was born that way, and had been treated by everybody in general, except a veterinarian, from the day it was born, and continued to grow worse until the original owner, in disgust, gave it away. I was called by the new owner, and found the little fellow with its pasterns and fetlock joints and coronary bands a mass of foetid sores, and it also had a pervious urachus. Tenotomy was advised as a possible way out of the difficulty, and was gladly accepted. The results from the operation were very favorable under the conditions met with in this case, as will be seen by the cuts on opposite page. So much so, in fact, that the former owner tried to buy the colt back, but the new owners (boys) refused to part with it "for love or money."

A PECULIAR CASE.

By W. E. MARTIN, V.S., Wapakoneta, Ohio.

On the morning of May 2, 1910, I was called about fifteen miles from my office to attend a parturition case in a seventeen-year-old mare. On inquiry I learned that labor pains had started about fourteen hours previous to my arrival. On examination found mare eating hay with seemingly very little pain. Pulse and respiration good; found posteria presentation with hind feet in vagina. Delivery of a very large foal was brought about by the aid of two assistants, and seemed to be not at all difficult, the mare standing during the act. Immediately after delivery the mare lay down, began straining and groaning and seemed to be in great distress. I got her to her feet and attempted to remove placenta which adhered very closely to uterus. After a very few minutes I found mare seemed very weak; respiration rapid; pulse imperceptible; mucous membranes pale, and every indication of severe internal hemorrhage. However, there was very little hemorrhage into the uterus. Seeing that further efforts to remove placenta would result in death of the mare, I



FIG. I.



FIG. II.

decided to let it remain in the uterus for a while. I expected the mare to drop dead any minute. She seemed so weak she could hardly stand. I gave hypodermic of strychnine and in an hour she seemed some better. I left fluid extract of nux to be given, and requested owner to call me by 'phone next morning. He called stating mare was up and eating and that he wished me to call and see her again. I called and found my patient in fairly good condition, and removed placenta without much difficulty. Irrigated uterus with a weak permanganate solution, prescribed echinacea and returned home. One week after owner came to my office and said that for three or four days previous mare had been continually straining as if to urinate, but that very little urine was passed. I called at the place again and found, on vaginal exploration, a swelling in the floor of the vagina which extended from the vulva to the uterus, almost completely filling the vagina and crowding the bladder and urethra over to the right vaginal wall, thus causing the frequent attempts to urinate. As the swelling was fluctuating I decided it was either a hematoma or an abscess and wished to make an exploratory puncture in order to diagnose the condition. To this the owner would not consent, so I left treatment and returned home. Some two months after I saw the owner and asked him how the patient had come out. He said that about one week after my last visit the swelling ruptured spontaneously and discharged a large quantity of very stinking pus, after which the mare seemed all right and was then in good condition.

A MONSTROSITY.

By E. H. Scott, Johnson, Vt.

Was called to see a thoroughbred Jersey cow having difficult parturition. A mass of intestines and other internal organs of the calf were hanging from vulva. Upon examination a bone-like growth could be felt wedged into pelvic cavity; with much difficulty this was returned and an examination was commenced for head and legs, which were found in one mass. Only two of the legs showed movable joints, one forward and one hind. The jointed hind leg was brought back and out, then with aid of parturition hook the monster was easily delivered.



The abdominal cavity was grown wrong side out with croup resting on neck; head, legs and tail all pointed the same way. Head and legs were well haired over and to all appearances was a full time calf. The cow recovered nicely.

WAS THIS AZOTURIA?

By WM. D. HOWATT, V.M.D., Portchester, N. Y.

Saturday, Nov. 5th, I drove my road horse about eight miles in the morning and about five in evening; put him in the stall for the night, gave him a scalded bran mash and regular attention, and left for the night.

Sunday morning I went to the stable at eight o'clock and into the stall to lead him out to start my morning's work. Instead

of being "snappy" and bright, I found a case of great depression, body all of a tremble, pulse tense and irregular, and left hind leg hardly able to support weight. I thought at first that in rolling he may have injured the region of hip, but could find absolutely nothing. I took his temperature and 100.4 was the highest. I led him ahead, and after three or four steps he placed weight on the leg and set it down very firm and remained with weight on the leg for, say, two minutes, shifted off to the other leg, and then would start off lame; after a few steps would again be practically normal.

He would look at sides as if colicky, paw sometimes very hard, and apparently was suffering pain; no desire for food or drink. As I had to hurry out, I left a dose of one ounce ext. buchu fld. and one-half ounce ext. digitalis fld. to be given. Did not return until 12.30, and could see no change. Gave second dose and at 3 p. m. could still see no difference. I thought azoturia was the only thing to cause so sudden and severe symptoms. At 10 p. m. repeated dose and as bowels and kidneys were in good condition, did not give a physic. Left instructions with stable man to call me if he got restless, but heard nothing, and this morning expected to find either a sure case or else complete recovery. No need to explain my happiness when he greeted me as he usually did, sound as a dollar and hungry as a bear; no indication of Sunday's trouble at all. I didn't drive him to-day, but had him led around for half an hour. This horse has done plenty of road work daily, never missing a day. Scalded mashes Wednesday and Saturday nights, and regular ration consists of 4 quarts of oats and 1 quart of bran. Why such an attack should effect him is a puzzle to me, especially so when he never gets a day off.

PERITONITIS-ENTERITIS-MELONOTIC TUMOR.*

By SCOTT WISNER, Omega, Neb.

The animal was a colt two years old, light cream color, had been castrated about six weeks before, and had made a nice recovery.

I was called to see the case at 3 p. m., and was told that he had been noticed the day before walking with a stiff gait and

* Presented at the annual meeting of the M. V. V. A., Omaha, July, 1910.

showing little inclination to move. At about noon he had appeared at the watering trough showing the same symptoms more aggravated, and had not left the water since that time. I found him playing with his nose in the water and pawing occasionally with his fore feet. Pulse 90, hard and wiry; respiration short and rapid; peristaltic sounds entirely absent; temperature, 107.4° . The extremities were cold, the abdomen tucked up, and the eyes had that peculiar haggard staring appearance so commonly seen in enteritis. I informed the owner that the colt had a severe case of peritonitis, which I suspected to be complicated with enteritis, and that there were no hopes of his recovering. I gave a small dose of morphine and atropine and left.

The colt died at 8 p. m., and I made a post-mortem examination the next morning. I found the entire peritoneum inflamed with extensive adhesions. The small intestine and the floating colon were also inflamed throughout almost their entire length. On the free border of the great omentum I found a large melanotic tumor which rotated, twisting the great omentum into a cord-like mass. This appeared to be the cause of the trouble, but what caused the rotation of the tumor I am unable to guess, as it was much elongated along the free border of the great omentum.

IT is gratifying to read in the November number of the *Journal of the United States Cavalry Association*, Captain W. C. Short's (13th Cavalry) report of his visit to the Fort Reno Remount Station, and his account of the excellence of the type of horses there and the splendid manner in which they are handled and cared for under the direction of Captain Hardeman. Captain Short believes one very potent factor in the great improvement of the type of horses at this station, over what he found there two years previous, is the purchasing of colts instead of mature horses; by getting a better type of a two-year-old for the money than you could a four-year-old, and besides they do better by coming into the army-horse life at an earlier age and growing up in it as it were. The same number also contains an article by Veterinarian William P. Hill (12th Cavalry) on the "Care of the Horse's Hoof," and one by Veterinarian Coleman Nockolds (1st Cavalry) entitled, "Notes on the Progenitors of Certain Strains of the Modern American Horse," which are very interesting reading.

ARMY VETERINARY DEPARTMENT.

PRESS THE ARMY VETERINARY BILL.

It is encouraging to see the legislative committee of the American Veterinary Medical Association five members strong, bearing names that are well known and that must inspire confidence in their skill and endurance, surely to be tested at the opening of Congress on December 4th.

For the information of the committee we have given in the November issue of the REVIEW a summary of the conditions under which our bill is held at present. Other difficulties may, of course, develop, as soon as the committee starts on its mission. As of yore the bill may again be blocked in its path by stern refusal or amicable excuse or subterfuge, methods that are so often successfully practised by legislators.

We beg the legislative committee to take a serious view of our bill. Its continuous failure since the year 1904 shows how easy it is for Congress to retard such a measure. If it fails again during the coming session, we may not only be checked in our development, but be instead subjected to a reaction that may destroy what we have gained since 1899. An army officer, well versed in Congressional tactics, recently said: "No one can tell what the future has in stock for army legislation. If a reaction should set in, it will weigh heaviest on the weakest branch of the service. Your veterinary service is very weak. Press your bill with all the strength you can muster. You should realize now, if you have not done so before, that it was only by a hard fight that we secured for you the recommendation to Congress, embodied in this bill, for your retirement on disability and old age. This passus was mainly won in the General Staff because you have a few *Civil War veterans*. They are now very old men, and should they die before the passage of your bill, I fear that you might revert to the civilian status of the contract surgeon. This is a worse position than the one you occupy now, and one that would represent a step backward."

We in the army know that this view is not overdrawn. It is a serious view, indeed, and should be a sufficient incentive to stimulate the members of the legislative committee to most zealous action. We wish them Godspeed in their work. O. S.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

A CASTRATOR'S ERROR [*J. L. Percy, M.R.C.V.S.*].—The author was called to attend to a three-year's colt upon which an attempt at castration had been made by an unqualified man, who, it was thought, had amputated the penis instead of a testicle. The horse was found with the sheath considerably swollen and after being cast, the hand introduced into the wound felt the mutilated end of the penis with the urethra protruding. An opening was made through the sheath so as to prevent further infiltration of urine. But although the urethra protruded it was impossible to sew it to the skin until the swelling had subsided and further interference was postponed. After several days the horse was seen again. He was found in an improved condition and with four inches of the penis hanging through the wound at the sheath and pointing backwards and downwards. The horse could urinate by a rather small opening at the urethra and soiled his hocks terribly. Operation to relieve this condition was suggested, but the owner declined it, and the horse, twelve months after, was reported doing his work regularly and well.—(*Veter. Journ.*)

ADENO-CARCINOMATA OF THE LUNGS WITH SECONDARY GROWTHS IN A COW [*J. A. Gilruth, M.R.C.V.S.*].—Record of the post mortem of a cow which was destroyed after an undiagnosed state of sickness. The carcass was emaciated. The lungs showed no growth externally, but the left had a large swelling. A dilated bronchia being opened, a neoplasm became visible. It had a circumscribed periphery, was ovoid in shape, fairly dense and fleshy in consistency. The cut surface was yellowish with irregular fibrous bands and here and there areas

of degeneration. Scattered through the lungs they were smaller spots, probably secondary. The mediastinal glands were enlarged and on section very similar to the aspect of the neoplasm of the lungs. The kidneys were also affected. One of those organs was more diseased than the other. They contained nodules similar to those of the chest. The cancerous nature of those growths was made out by microscopic examination.—(*Veter. Journ.*)

AN INTERESTING SPLEEN, THE RESULT OF STRANGLES [*John Varney, M.R.C.V.S.*].—A hunter gelding had strangles. The disease ran its normal course but was particularly remarkable by the great amount of suppuration that came out of the abscesses. For several weeks, the manger, rack and boards of the stall had to be cleaned off and disinfected three times a day. After a long period of sickness and of depravation by the abscesses, the animal seemed to enter into convalescence, but yet remained delicate, ailing and in poor condition. The animal had never manifested any trouble of the pulmonary apparatus and fears of an abdominal collection of pus was entertained, although nothing seemed to call the attention in that direction. Careful watching, however, revealed "that the animal was often lifting his legs, one and then the other, towards his abdomen, with a corresponding twitching movement of the tail, and then throwing his head up with a groan and deep sigh. He often laid down; had no trouble about his bowels or kidneys." He finally died without a struggle. At the post mortem the spleen was found enormously thickened, enlarged, weighing thirty-seven pounds and adherent to the abdominal walls, diaphragm and stomach. There were strangles abscesses between the spleen and stomach. There was one also in the front part of the thorax. The lungs were consolidated in some places.—(*Ibidem.*)

AN INTERESTING MONORCHID [*Prof. F. Hobday, F.R.C.V.S.*].—Two-year old chestnut horse is presented as one of three cryptorchids for operation. He presents no evidence or has history of previous attempts at castration. The left testicle is present and removed. The right cannot be found, but instead a gradual merging of the end of a rudimentary cord into the lining of the peritoneum of the pelvis and no testicle. The wound is closed and the animal left to rise. Several hours after he is found with violent colic, the sutures have given way and

the bowels hanging down as far as the hocks. This condition is attended to at once, but peritonitis soon sets in and the horse dies. Post mortem: Complete absence of testicle, no evidence that one had ever existed, spermatic cord traceable and merging into the pelvic peritoneum. There were also extensive lesions of peritonitis.—(*Veter. Journ.*)

OXYGEN GAS IN THE TREATMENT OF PNEUMONIA [*Oscar Stimson, M.R.C.V.S.*].—Having a bad case of pneumonia in hand and being very desirous to do all he could to save him, the author decided to try oxygen inhalations. A cylinder of gas was obtained and a rubber tube with a glass funnel fitted on it. “The funnel was directed to the horse’s nostrils, the regulating tap turned on so as to give a small but steady stream of gas and then the pipe was alternatively pinched and released as the horse expired and inspired. The flow was kept up for ten minutes and repeated after half an hour intervals. The result was not favorable as the animal died. But the effects were worth noticing.” The respirations were, to commence with, seventy-five per minute, but became slower and easier in a few seconds and fell to sixty-two per minute, until the oxygen was stopped. Each administration showed a like result and gave a great deal of ease to the patient. The author says that he will use oxygen again in all respiratory difficulty he may have a chance to meet with.—(*Vet. News.*)

TETANUS IN A PIG [*James Forbes, M.R.C.V.S.*].—This young animal presented marked tetanus symptoms: Rigidity of the muscles, clenched jaws, labored breathing, retracted membrana nictitans, tail curled tightly over the back and ears drawn towards the median line. He had been castrated several weeks previous. For treatment, the wounds of castration were well washed with antiseptic solution and painted with pure tincture of iodine. Twenty grains of sulphate of magnesia with one minim of carbolic acid were injected in one-half an ounce of boiled water twice a day. After each injection some relief took place and the animal was able to stand, walk and drink. In about one week he had improved so much as to be able to take more solid food. Gradually the number of injections were reduced, and sulphur added to his food. However, the stiffness of the hind legs never left him entirely. The pig died after two weeks of treatment.—(*Veter. Record.*)

BACELLI'S TREATMENT OF TETANUS [*Wm. Collinson, M.R.C.V.S.*].—Following castration, after five weeks from operation, this one-year-old nag colt was sick for four days, during which he received one drachm of solution of carbolic acid, ten per cent., every two hours. He had, however, showed perhaps a little less nervousness in the last two days. He died at night in slings. Every place where an injection was made left considerable swelling.—(*Veter. Record.*)

FRACTURE OF THE DENTATA—UNUSUAL CASE [*H. Taylor, F.R.C.V.S.*].—This mare was sent to a horse-breaker and as she was rather hot tempered and had a decided will of her own, she resented any undue treatment. She was tied up as usual and suddenly one of the grooms heard one of the horses struggling. She was found lying on the ground. The halter shank was tight and instead of passing direct from the head collar to the place of fastening, it passed from the former up towards the ears, over the poll and from thence to the place where it was fixed. The mare had hung back on the halter and cast herself. After being relieved, not without difficulty, the animal made no attempt to get up. She died in twenty minutes. The dentata was found fractured into seven pieces. The neural canal was full of blood.—(*Ibidem.*)

NORMAL PARTURITION AFTER EVERSION OF THE UTERUS [*Same Author.*].—After a cow has had eversion of the uterus, generally no other occasion of another similar accident is given to her and she is fattened for the butcher. The author relates three cases which show that it does not follow that the succeeding calving will necessarily be followed by a repetition of the eversion. In two the uterus was everted in full and more or less swollen. In the third the eversion was smaller. In all three the succeeding calving was perfectly normal.—(*Ibidem.*)

RUPTURE OF THE ANTERIOR MESENTERIC ARTERY BY STRONGYLUS ARMATUS [*G. W. Townsend, F.R.C.V.S.*].—Nine-months-old thoroughbred has been very thin and unthrifty in appearance for several weeks. His case is hopeless. He was in a state of collapse with pulse small, quick and weak. The respiration accelerated, the extremities cold, the temperature normal, the mucous membranes were pale and the animal walked staggering. Intestinal parasites were diagnosed. The colt died

the next day. In the abdomen in the upper part and imprisoned with the intestinal contents, there was a big clot of blood. Rupture of a large blood vessel was evident. The clot was carefully removed and a rupture of a verminous aneurism, near the origin of the anterior mesenteric artery was exposed. The walls of the aneurism were thick and in the cavity were several specimens of *Strongylus Armatus*.—(*Veter. Record.*)

RUPTURE OF THE FLOATING COLON WITH ONE OF THE STOMACH [H. J. B. Eve, M.R.C.V.S.].—Case of an aged roan gelding which was taken with violent abdominal pains from which he died after being diagnosed as a case of engorgement of the stomach with gastric tympanitis probably complicated by rupture or twist. Post mortem confirmed the diagnosis. The symptoms presented were: Very acute abdominal pains; anxious expression of countenance; pulse quick, wiry, feeble and running down; visible mucus highly injected; respirations accelerated; temperature sub-normal; body covered with cold sweats; ears and legs cold; frequent tremors of the neck and fore limbs; great prostration; constant pawing with the fore feet; severe tympanitis; constipation. Frequent arching of the neck and attempts at vomition. Towards the end spumous discharge from the nostrils.—(*Ibidem.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

[INTOXICATION BY CAFFEINE IN LARGE DOSES IN A DOG—RECOVERY WITH CHLORAL [L. Giraudet, Army Veterinarian].—A dog weighing between twenty and twenty-five kilogs., having a bad attack of distemper with broncho-pneumonia and pleuritic manifestations, was submitted to rational treatment, and as stimulant and diuretic, was prescribed to have one-third of a tablespoonful three times a day of a solution of caffeine made to contain 50 centigrammes of caffeine in a tablespoonful or a little over 15 centigrammes at each dose; certainly a small dose, taking into consideration the weight of the dog. Through some misunderstanding the dog received three tablespoonfuls every day. Three or four days after, as the animal was about

to die, the writer was called again and, on account of his condition and the symptoms presented (great dyspnea, spasmotic contracture of the jaws, labial breathing, paraplegia and clonic contractions of the paws), the owner wished him to be destroyed. To do so 10 grammes of chloral were given per mouth in concentrated solution. After three-quarters of an hour, the dog woke up, came out of his bed, walked quite strong and drank some milk. The bad symptoms of caffeine were all gone. Chloral had evident antitoxic effects against caffeine.—(*Bullet. Soc. Scient. Veter., Lyon.*)

EPITHELIAL CANCER OF THE KIDNEY GENERALIZED TO THE LUNGS IN HORSES [*Dr. Antonio Maja*].—In one case it was a fourteen-year-old mare, which was under treatment for wounds of the mouth and left nostril, which were accompanied with frequent and somewhat abundant hemorrhages. To lay aside all suspicion of glanders the animal was malleined, but with negative results. The animal was very anemic and ultimately died. At the post mortem there was found hemorrhage of the duodenum, the left kidney was much hypertrophied and deformed by the presence of a tumor which involved half of the renal structure. It was irregular in form, lobulated, and composed of easily torn tissue. The renal lymphatic glands were also affected. In the lungs there existed also a small metastatic nucleus having the same character as that of the renal tumor.

In the second case it was from a horse which had had several attacks of colic and died in one of them. At the post mortem, there was found a double renal neoplasm with pulmonary generalization. The left kidney weighed five kilogs. and seven hundred grammes. It contained a tumor similar to that of the preceding case. In the right kidney the lesions were less developed, but similar in nature. The microscopic examination made by the author revealed that the tumors were primitive epithelioma.—(*Bullet. Soc. Centrale.*)

PLEURITIC MELANOSIS—FATAL CARDIAC SYNCOPE [*Mr. Cuny*].—Gray Percheron mare, seven years of age, had always done good service. One day returning from work she is reported dull, breathing with difficulty, and she has been obliged to stop several times while in harness. She has refused eating hay for a few days. Seen immediately by the author, who was present, the mare shows severe dyspnoea, the number of respira-

tions being very difficult to count, as they were probably more than a hundred to the minute. There is no roaring. The conjunctivæ are very congested and the superficial veins largely dilated. Temperature is 39.7° . After a while the dyspnœa subsided some and yet the respirations remained very high. Auscultation indicates that breathing is normal all over the chest. The pulse is irregular, small and about 150 a minute. It is also intermittent. Exploration of the heart gives dull sound and corresponds in its irregularities to those of the pulse. An infectious disease of the respiratory apparatus in its incubative stage is suspected and expectant treatment prescribed: general friction with mustard, digitalis powder and nitrate of potash internally. Carefully watched, the animal seems more comfortable after a little time, but all of a sudden she drops down and dies.

Post Mortem.—The lesions were all located in the thorax, where numerous melanotic tumors were exposed. In large number, isolated, varying in size between that of a pea to the size of a hazelnut, irregularly disseminated all over the parietal and visceral pleura, they were found on the ribs, diaphragm and posterior mediastinum. Round the heart they formed big grapes, surrounding the cardiac muscle and covering the auricles and large blood vessels. At the entrance of the chest there was a compact blockade of tumors which had destroyed the anterior mediastinum and surrounded the blood vessels and nerves. There were no traces of melanosis in the pericardium or pulmonary structure. Under each shoulder there was a small melanotic deposit.—(*Journ. de Zootech.*)

TUMOR OF THE NECK OF THE UTERUS IN A BITCH [Mr. L. Auger].—This animal was four years old and for several months has had a bloody discharge from the vulva; she is otherwise in splendid condition. Vaginal exploration reveals nothing particular except that the fingers introduced are brought out covered with muco-bloody discharge. Abdominal manipulation gives the sensation of a large hard cylindrical and elongated body extending from the front of the pubis to inside the pelvis. Examination of the vagina made with the speculum permits the detection of a round mammilated mass protruding in the vagina. It is a neoplasm of the uterine neck or its surroundings, which has to be removed either by hysterotomy or abdominal hysterectomy. The dog is anæsthetized and the regions to be operated on are shaved and aseptized. Laparatomy is performed and the

enlarged body of the uterus appears, containing a hard mass, which is engaged in the pelvic cavity parallel to the rectum. On this account hysterectomy is not possible as no ligature can be applied far back of the tumor, which extends into the vagina. Hysterotomy is then performed. The uterus is open, the tumor is found fixed by its center on the left side of the womb near the neck. It is carefully drawn and pulled out and a ligature is applied on its base. Resection is performed above. But in so doing a portion of the walls of the uterus has been cut also and for fear of complications, hysterectomy had to be performed in the usual way. Dressing of the peritoneum, abdomen closed, skin sawed up and dry dressing applied, concluded the entire proceedings. Everything went on very well, for the first two days when the dog pulled away the dressing, the intestines hang from the abdomen by the tearing of the sutures. Death followed. The tumor measured 10 centimeters in length, from 4 to 5 in diameter. It weighed 150 grammes. It was a cystic fibromyoma.—(*Journal de Zootech.*)

EVENTRATION AND WOUND OF THE RUMEN—RECOVERY [*Mr. A. Sarreau*].—A herd of cattle is coming down the mountains. One of them, a five-year-old cow, is pushed by another and falls into a precipice, where she remains impaled on the stump of a tree. Relieved from her position, she lays on the right side, with the left abdominal walls torn, skin and muscles from the point of the ilium to the posterior border of the last rib. The edges of the wound are bleeding and soiled with food. Careful examination reveals a perforation of the rumen 8 centimeters long and 5 wide. On the posterior border of this there is a portion of tissue torn and bruised. Food has dropped in the peritoneal cavity. The treatment was difficult to apply on account of the circumstances and location. The abdominal walls were covered with fenestrated cloth dipped in sublimate solution. The peritoneum was cleaned as well as possible with boiled salted water and the bruised and torn tissue were removed. The edges of the wound of the rumen were brought near those of the skin with the rumen sutured with big thread disinfected in boiled water; the muscles were sewed up and finally the skin. The whole was protected with an iodoform dressing. A pint of hot sugared wine was given to the cow, which was then slowly taken home. Seen a month after she was found in perfect health, fattening fast, and none the worse for the ordeal she had gone through.—(*Prog. Veter.*)

BELGIAN REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

RUPTURE OF THE AORTA [*C. Verlinde*].—This is the post mortem of an old horse that was found in the morning dead in his stall. On opening the cadaver, the abdominal organs were found very pale. The thoracic cavity was full of blood clots, red, easily broken up in some places, white and very hard in others. Among them, the lungs, pale and retracted, are reduced in size. The pericardium has a large opening on a level with its insertion on the aortic trunk. It is full of clotted blood, and at first sight the heart appears as greatly hypertrophied, but when the blood is washed off, it is seen with its normal size and free from alterations. The primitive aorta has a transversal rupture at its origin on the free border of the sigmoid valves. This rupture occupies the convex or anterior part of the vessel, begins exactly at the level with the left coronary artery, runs forward, then to the right in following the free border of the sigmoid valve to end three centimeters near the insertion of the right coronary artery. The visceral pericardium is torn, covered with hemorrhagic spots. The tissue of the aorta was normal. The large thoracic blood vessels were filled with cylindrical clots, fibrinous and hard.—(*Bullet. Mede. Veter. Pratiq. Malines.*)

LACERATION OF THE DIAPHRAGM [*Same Author*].—Eight-year-old saddle horse reared suddenly and falls backward. He dies almost immediately. At the autopsy there was found on the line of separation of the phrenic center and muscular portion of the diaphragm on the left side, a large laceration running from upwards to downwards and involving the entire structure of the muscle. The diaphragmatic curvature of the large colon has passed through the opening and is pushing under, the left lung and the heart which pressed upwards and forwards are squeezed against the superior wall of the thoracic walls. Between the colon and the right lung there were the stomach, liver and spleen pressing the lungs against the costal walls.—(*Ibidem.*)

A DOUBLE RIGHT INFERIOR TUSK [*Same Author*].—Mentioned in the jackass, this abnormality is comparatively rare.

A seven-year-old horse, at times was observed bleeding from the mouth and had some difficulty in chewing his food. With the mouth widely opened with a speculum the tongue, being pulled out, is noticed with its inferior face on the right side literally covered with wounds irregularly parallel and deep, some cicatrized, or partly so and others bleeding. On a level with the second right lower molar, a tooth is implanted at right angles in the maxillary branch. It has the shape of a tusk and is very sharp. It is readily extracted with forceps and the trouble ceased at once.—(*Ibidem.*)

GENERALIZED SARCOMATOSIS IN A COW FOLLOWING A PAROTID SARCOMA [H. R. Bredo].—A cow had, on the right parotid near the thick portion of the posterior border of the inferior maxillary, a rather hard tumor as big as a man's fist. Adherent to the skin, it has an ulceration with a fistula running into a cavity from which, by pressure, is squeezed out sanious fluid with fetid gangrenous odor and containing soft debris mixed with small calcareous concretions. This neoplasm has grown slowly and as the condition of the animal is getting bad she is destroyed. At the autopsy; besides the parotid tumor, lesions of generalization were found. The lungs contained numerous lesions of various aspect and size on the superficy and in the thickness of the pulmonary lobes. The bronchial glands were diseased. The heart itself was involved, and some lesions similar to those of the lungs were found in its structure. The liver, pancreas, kidneys were also filled with similar tumors and presenting the same characteristics and appearance as the neoplasm of the parotid. The rumen, omentum, small and large intestines, were similarly invaded. The spleen and other organs were free from any apparent lesions.—(*Ibidem.*)

SYMPTOMS AND DIAGNOSIS OF COLICS PAR INVAGINATION IN BOVINES [Ch. Tyvaert].—Diagnosis: The symptoms given by the author are as follows—Violent colic lasting from six to twelve hours and followed by deceiving quietness; anorexia and arrest of rumination; tendency to assume position by which the fore quarters will stand higher than the hind ones; stretching of the vertebral column and forming an arch with concavity looking upwards; and dejections mucilaginous and almost always bloody. These manifestations are *positive* for a diagnosis of invagination, even if rectal examination remains negative. Dif-

ferential Diagnosis—In colic accompanying torsion of the uterus the animal does not assume the position of lower hind quarters; he constantly shakes his tail, micturates often, the lips of the vulva and the clitoris are the seat of continued contractions, vaginal exploration revealed the twisting. In very recent *traumatic pericarditis*, the respiration is accelerated, and moaning, pressure on the withers is very painful; the animal strikes with his fore feet either the ground or the sternal region. The cardiac beatings become less and less audible. There is a regurgitating noise and increased dullness over the heart. In *bacteridian anthrax*, colics are duller, and the animal does not assume the position met in invagination. Often blood escapes from the nostrils, mouth or anus. Fever is always very high and death occurs rapidly.—(*Annales de Bruxelles.*)

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DR. W. N. ARMSTRONG, Concord, Mich., says: "Enclosed find \$3.00 for A. V. REVIEW. I forgot to remit earlier and find it impossible to get along without the reading matter it contains."

BIBLIOGRAPHY.

- A TEXT BOOK ON DISEASE PRODUCING MICRO-ORGANISMS. Especially intended for the use of Veterinary Students and Practitioners. By Maximilian Herzog, M.D., Professor of Pathology and Bacteriology in the Chicago Veterinary College; Pathologist to the German and the Alexian Brothers' Hospitals of Chicago; late Pathologist in the Bureau of Science, Manila, P. I., etc. Octavo about 650 pages, with 214 engravings and 14 colored plates. Cloth \$4.75 net. Lea & Febiger, Publishers, Philadelphia and New York, 1910.

This work, coming from the pen of a recognized authority, such as its author, whose several professional connections, medical and veterinary, have given him ample opportunity to follow his studies, will be welcomed by the veterinary profession of America and other English-speaking countries; the first of its kind in English to cover the entire field of pathogenic micro-organisms from the standpoint of the veterinary student and practitioner. Chapter I. is in the form of an introductory historical review, dealing with the origin of the microscope and the wonderful advances that followed in its train. Chapter II. deals with organisms, saprophytes, parasites and general remarks on disease-producing micro-organisms. Chapter III. defines bacteria and their position among organisms, types, etc., with illustrations. Among others, glanders bacillus, the bacillus of bubonic plague, anthrax and Asiatic cholera. Chapter IV. is on the biology of bacteria, temperature limits, nutrition, the reaction of the medium in which they grow, etc. Chapter V. deals with the occurrence of pathogenic bacteria in nature and routes of entrance in infection. Chapter VI. studies infection, phagocytosis and opsonins, going fully into protective agencies and lessening of virulence. This chapter includes an illustration of an opsonic incubator and opsonizing pipette. And so through the entire work in his thorough manner, the author deals in the succeeding chapters with antibodies, beautifully illustrating Ehrlich's side-chain theory and the Wassermann test; the methods of observing bacteria, the use of the microscope and acces-

sories, culture media and their sterilization, identification of bacteria, pyogenic bacteria in domestic animals, with illustrations of lip and leg disease (*bacillus necrophorus*) in sheep, a paragraph on the bacillus of dog typhus; and finally getting into practical application, considerable space is devoted to vaccine therapy and protective inoculation, pathogenic bacteria in milk, cattle diseases transmissible through milk and bacteria in butter and cheese making. A chapter is devoted to simple chemical manipulations, normal solutions and indicators required in laboratory work in bacteriology. In short, it is a work that no veterinarian can afford be without at this time when biology plays such an important part in the treatment of diseases, and the teacher will find it peculiarly adaptable, as each chapter is followed by a list of questions pertaining to the subjects treated in it.

THE REVIEW office was recently honored by a visit from R. C. Longfellow, M.D., of the Toledo Clinical Laboratories. This broadminded member of our sister profession is Pathologist and Bacteriologist to the North Western Ohio Veterinary Medical Association, and has demonstrated his love for work rather than mere honor by having, since his connection with that organization, studied urine from azoturia patients, examined tissue specimens from clinical cases for diagnosis, prepared autogenous vaccines for all pus cases, infections, nasal secretions, etc. He has examined heads of animals for rabies, and given the protective treatment to exposed individuals. In fact, Dr. Longfellow's services along all lines are open to the veterinary practitioners on the same basis as to his brothers in the medical profession. He refers to the veterinarians as his "veterinary brothers," in whose hands, the doctor says, he has seen splendid results from the use of autogenous and stock vaccines in pus cases, and holds that all biologic remedies have a useful field in veterinary medicine, but the same technique, care and precision must be exercised in their preparation as when made for use on man. Dr. Longfellow delights in the acquaintance of the progressive man, and it matters not to him which branch of medicine he belongs to. He is the veterinarian's true friend, not only in Ohio, but everywhere.

SOCIETY MEETINGS.

IOWA VETERINARY ASSOCIATION.

The Twenty-second Annual Meeting was called to order at Des Moines, Iowa, January 15, 1910, at 2 p. m., President Talbot presiding.

Address of welcome by Mayor A. J. Mathis. Response, State Veterinarian P. O. Koto. A vote of thanks was extended Mayor Mathis.

PRESIDENT TALBOT'S ADDRESS.

Brother Members of the Association—It is with extreme pleasure that I greet you to this, the twenty-second annual meeting of the Iowa State Veterinary Medical Association.

On behalf of the entertainment committee and our local veterinarians I welcome you to our city and trust that your three-days' visit with us may be as pleasant as the pleasure we experience in entertaining you.

Our local committee has been untiring and unselfish in its efforts to procure for you an interesting entertainment and an instructive clinic and has spared no pains to make this gathering both pleasant and profitable. However, if we have failed to meet your expectations, remember that we have tried and that no one will regret the failure more than the local entertainment committee.

The evidence of your friendship and good will which I received one year ago at Ft. Dodge by being elected your president, is only another gem in my book of memory, a gem which stands out bright and clear as indicating your trust and esteem and should my future professional career be barren of further recompense I would still deem myself amply repaid for any service which I may have been able to render in the past.

I wish to express my heartfelt appreciation and gratitude for your loyal support and to assure you that I only accepted this office with the realization that it is not the official which makes the association, but that it is the association which makes the official possible and which fits its members for that position.

Knowing full well that it requires not only your attendance, but the hearty co-operation of each and every member to enable the Iowa State Veterinary Medical Association to attain its present rank as one of the foremost of the state associations, I yet feel that a great deal must be accomplished before we have reached the limit of our sphere of usefulness. First, let us consider that Iowa has over 400 graduated veterinarians and that less than fifty per cent. of these are members of this association; and then allow me to suggest that each member present appoint himself a committee of one to secure at least one new member during the coming year and that he send his name to our secretary before the next meeting. It is gratifying to know that when once a veterinarian joins our association, he is generally ours for all time and so nearly has this become a rule with our membership that we can say with considerable truth: "Once a member, always a member." In fact I can hardly conceive of a veterinarian attending one of our meetings, but that he should return to his duties encouraged and better equipped for another year of service and feeling that his time and money had been well spent. Remember that new veterinarians are constantly coming into our state; men who can be of use to us and to their community as members of this association, so let us consider it not only a duty, but a privilege to ask them to join us and to help us in our effort toward the betterment of their own condition as well as that of the public which they serve.

While the history of our association up to the present time has been largely a program of education, let me suggest that this program be broadened so as to include the education of our membership to meet the legislative problems which now confront us. Let me illustrate by calling attention to the city in which we are now assembled. Des Moines, the capital city of Iowa, and its metropolis, has enjoyed a wonderful growth during the past two years. Our adoption of the commission form of government has attracted the attention of practically the entire country and just as our national government was once the subject of controversy and doubt among the older governments of Europe, so has the commission form of government and its workings been watched with a great deal of interest by the older municipalities of this country, and I may add that just as our national government proved its worth and found imitators among the older nations, so has the commission form of government proved its worth, and under the able leader-

ship of our worthy mayor and the men who have been associated with him in this work, our municipal affairs have been so administered that the growth of our city has been third among all of the cities of the country and for the month of December we led the entire country in the percentage of our improvements.

I have mentioned these facts, however, only for the purpose of emphasizing a crying need which has not been supplied by our municipal government, a precaution the necessity of which younger and smaller cities have seen the need, but which seems to have been passed unnoticed by our city commissioners in the rush of larger and more apparent necessities. I refer to an ordinance providing for the rigid inspection and testing of the dairy herds from which the city is supplied.

The little city of Colfax, so close that it may almost be considered one of our suburbs, has seen the necessity for such action and has an ordinance requiring the municipal inspection of all dairy herds which supply the milk sold in that city, and yet the largest and most progressive of the cities of Iowa, the capital of the state and the city to which others should look for pioneer legislation, is strangely backward in this most necessary of all legislation, the protection of the health of its citizens.

I do not wish to advocate the profession of a politician for each of you, but I do feel it my duty to urge each of you to make the most of his opportunities to cultivate the acquaintance of his senators and representatives, to the end that he may be able to cast his influence upon the side of right when this great question comes up for final settlement, as it must in the near future.

Our state veterinary law and the changes it has wrought for the betterment of the conditions of the veterinarian, are now matters of history. This spring marks the tenth anniversary of the passage of that law, ten years which have seen the widely scattered remnants drawn together in a vast state brotherhood, which have seen a diversity of selfish interests sacrificed for the common good, until even those who were at first the enemies of the law have finally recognized its beneficent effects and are one in upholding it. The country at large seems just awakening to the fact that to the farmer and stock-raiser of the middle and western states it must look for its future food supply. Thousands of dollars are annually being spent to bring into this and surrounding states some of the finest stock that the world has ever

seen and it is to you, my brother practitioners, that the stock-owner must look when disease threatens his herd and he sees the savings of years being swept away. Let us not be remiss in our duty to those who place their trust and their fortune in our hands. Let us ever be keenly alert to the march of events, keeping thoroughly abreast of the times, reaching out for that which is good in the new, but never at the expense of that which was better in the old. In fact that conservative policy which is contained in these old lines still retain their potency and truth:

“ Be not the first by whom the new is tried;
Nor yet the last to lay the old aside.”

In closing let me make a plea for a more tolerant spirit between the members of our profession. Let the old jealousies which in the past have set our work at naught be forgotten, and, remembering that “in union there is strength,” let us present a solid front to those who oppose the great legislative reforms which we know are vital to the health of the community.

Reading of the minutes was dispensed with. Instead they were accepted as published in the April number of the AMERICAN VETERINARY REVIEW. Report of secretary was read and considerable time taken to discuss that part relative to time of next meeting. Finally a motion was made and carried that we have a clinic and that the time and place for the meeting be left to the Executive Committee, only that it be held early in January.

The resignation of T. A. Shipley was accepted, and Dr. Shipley elected to associate membership.

Report of the Committee on Sanitation read and discussed.

Dr. W. B. Niles gave a talk on “Hog Cholera Serum,” and a demonstration of injection of serum, after which he answered a great many questions relative to the results obtained from the serum.

Meeting called to order 8.15 p. m.

Dr. D. M. Campbell, of Topeka, Kansas, editor of the *Missouri Valley Veterinary Bulletin*, read a paper on the use of Bacterins, which was very freely discussed.

Dr. Campbell was elected to associate membership.

Dr. A. G. Field (M.D.) being present, made a short talk and said some very nice things about the veterinary profession and the wonderful advances it has made in the last few years. Prof. L. H. Pammel being present, gave a talk on Fungi, which was quite freely discussed by a number, Dr. Stange telling of

some cases of forage poisoning where the mould was found growing in the mucosa and sub-mucosa of the intestine. A vote of thanks was extended to Prof. Pammel. Dr. F. H. Hollingsworth reported a case of glanders.

The reliability of the mallein test as well as its curative effects, if any, were quite freely discussed; it was found that there were many men of many minds amongst those present.

Second day. Meeting called to order at 10 a. m.

Dr. Strange, chairman Committee Disease and Treatment, rendered his report.*

Dr. G. A. Scott reported a case of Alopecia affecting a livery horse doing ordinary work of his kind; hair is now growing in again nicely.

Dr. W. E. Miller gave a report of an outbreak of anthrax.

Dr. N. M. Repp reported a case of a suckling colt running at pasture on a creek bottom which became mired in a bayou on his side; in getting out tail was pulled off up to sacrum, muscles badly injured and bled very freely. Feces lodged for a long time owing to the rectum falling forward, the superior attachments being torn away; final recovery, except mutilation.

Treasurer's report was read and reported as correct by the Auditing Committee.

Dr. W. A. Heck reported cases of infection in foals, abscesses in gluteal region, later shifting to region of rectum and along the tail; slow to heal; usually commence with lameness in front; constipation nearly always present to quite an extent; all were weanling foals. Some cases live only a week, others drag along for nearly a month, no navel infection. Supposition is that it is due to parasitic infection. Some cases recover without abscess formation when given internal antiseptics early.

REPORT OF COMMITTEE ON RESOLUTIONS.

We, the Committee on Resolutions, beg leave to report as follows:

Resolved, It is with deep regret that we chronicle the loss of one of our valued and active members occasioned by the death of Dr. T. D. Hulme, of Commerce, Iowa. Be it further

Resolved, That a copy of this resolution be spread upon the records of this Association.

Resolved, Whereas an all-wise Providence has removed from our midst, Dr. Milikin Stalker, a one-time active and honored member of our association, and one who always took a deep

* Will appear in January issue of REVIEW

interest in the advancement of our profession. Therefore, be it

Resolved, That in the death of Dr. Stalker, we have lost a valued friend and co-worker. Be it furthermore

Resolved, That we deeply regret this loss and that a copy of these resolutions be spread upon the minutes of this association.

Resolved, That this association unanimously endorse one of its members, Mr. George Judisch, as delegate to the United States Pharmacopeal Convention. And be it further

Resolved, That it is the opinion of this association that the profession should be represented on the board appointed to revise the United States Pharmacopœa.

Resolved, That in the interest of the public health, we believe that ordinances in every municipality in the state should be passed to insure the healthfulness and wholesomeness of milk and meat food products.

Resolved, That in order to prevent the spread of the contagion of tuberculosis within the state, we recommend that all cattle sold for dairy or breeding purposes at public auction should be subjected to the tuberculin test by a qualified veterinarian, and a certificate of health be delivered to each purchaser.

Resolved, That Tuberculin is recognized as a reliable, diagnostic agent when properly used. Therefore, in order to prevent its fraudulent use, we recommend the enactment of a law requiring that a report of each and every sale of Tuberculin within the state, be made to the State Veterinarian within ten days from date of sale.

Resolved, That hereafter, the wives and sweethearts of the members of this Association be extended a cordial invitation to attend the annual banquet of this association.

Wednesday, 1.30 p. m., called to order, A. S. Brodie in the chair.

C. L. Wilhite reported on treatment of pneumonia, which was very freely discussed. George Judisch, Professor of Pharmacy, Iowa State College, gave a talk on pharmaceutical subjects, and resolutions were passed on some of the points suggested by Mr. Judisch. J. H. McLeod, "Control of Tuberculosis"; G. M. Walrod, "Tuberculosis in a Mare." These two cases were discussed together. Dr. Dyson, of Chicago, was called on for remarks on the subject of tuberculosis. He emphasized the necessity for local meat and milk inspection with compulsory slaughter of reactors. Motion by Dr. Koto that Committee on Resolutions be instructed to incorporate the request

that Mr. Judisch apply for representation by a veterinarian on the Board to revise the *Pharmacopoeæ*. Amended by Dr. Stange, that fifteen dollars be appropriated to help reimburse Mr. Judisch. Carried.

The secretary was instructed to cast the ballot of the Association for election to membership of the following gentlemen: A. C. Middleton, B. Fisher, C. E. Fuller, A. I. Kulp, E. C. Sheumaker, J. M. Vernon, H. J. Hagerty, S. H. Johnson, L. E. Smith, E. E. Black, C. E. Blakely, C. L. Gamrath, G. E. McIntire, F. W. Larson, F. J. Kennedy, J. M. Nelson, J. F. Thomsen, J. E. Frank, A. N. Tyler, E. J. Higgins, A. S. Morris, P. Cain, Robert Mollance, L. Jennings, Robt. D. Wall, C. W. Ferguson, H. A. Alcorn, A. J. Abarr, C. E. Hunt, F. E. Brazie.

Dr. S. Beattie presented a case report, "Ovine Pneumonia." Dr. R. R. Dykstra gave a talk on "Some Anatomical Points of Practical Importance." This was an interesting talk to all practitioners.

Election of officers resulted as follows: President, F. J. Nieman, Marshalltown; First Vice-President, H. B. Treman, Lake City; Second Vice-President, G. M. Walrod, Storm Lake; Secretary-Treasurer, Hal C. Simpson, Denison; member of Executive Committee for full term three years, R. R. Dykstra; member of Executive Committee for one year, to fill vacancy caused by resignation of President Nieman, D. E. Baughman.

A banquet was held at The Savery, which was an innovation, none having been held for a great many years. Nearly seventy-five attended and all spent a very pleasant evening. Excellent singing was rendered by a quartet, of which Dr. J. I. Ginson of the local committee was a member.

Among the visitors present were: Professor R. Chittick, State Chemist; Phil Kell, editor of the *Spirit of the West*; Dr. D. M. Campbell, of the *Missouri Valley Bulletin*; Professor Pammel, of Ames, Iowa State College; Dr. O. A. Dyson, of Chicago, and Dr. Richard P. Lyman, Secretary of the A. V. M. A. Dr. S. H. Bauman (veterinarian), a member of the Legislature from Van Buren County, a Democrat elected by a large majority from a strong Republican district, responded when called upon by the toastmaster, Dr. S. Stewart. At a late hour we adjourned, agreeing to meet around the banquet table next year and to have the wives and sweethearts with us at that time.

Meeting called to order at 9.30. C. J. Heckard not being present, secretary read his report of a case. Discussed by a num-

ber with possibility of being Hæmorrhagic Septicæmia. Other suggestions were Blacklegoid falling out of injector or having so much vaseline around as to become encysted and never dissolving. Dr. R. P. Lyman was requested to outline the proper method of procedure in making a thorough tuberculin test. After which the subject of tuberculosis and tuberculin testing was discussed by a great many of those present. Report of the Committee on Resolutions was read and accepted. Report of the Committee on Legislation was read and accepted. Dr. R. P. Lyman and Dr. O. E. Dyson were elected to associate membership. Meeting adjourned to visit Dr. J. I. Gibson's hospital, where clinic was held. Owing to the inclement weather there was not a great deal accomplished along this line.

HAL C. SIMPSON, Secretary.

TENNESSEE VETERINARY MEDICAL ASSOCIATION.

The second annual meeting of this association was held in Nashville, Tenn., November 3d and 4th, in the Assembly Hall of the Hotel Hermitage. The meeting was called to order by President Giltner at 10 a. m. Address of welcome by Hon. H. E. Howse, Mayor of Nashville. Response to address of welcome, Dr. G. B. Giltner, Murfreesboro, Tenn. President's address, by Dr. Giltner. Roll call, by Dr. A. C. Topmiller, secretary, Murfreesboro. Minutes of last meeting were read and unfinished business disposed of.

Reports of Executive, Legislation, Finance and Resolution Committees. The following resolution was offered by Dr. Geo. R. White, chairman Committee on Legislation, and accepted unanimously:

Be it resolved that the secretary in conjunction with the chairman of the Legislation Committee be instructed to secure an up-to-date list of the practitioners of veterinary medicine and surgery in Tennessee, and that expense be paid by the association. Be it further resolved that this association go on record as favoring the various recommendations in the president's address, and the report of the Committee on Legislation, and that we lend our united support to our Committee on Legislation in their efforts toward securing legislation.

Applications for membership.—Addam Elmore Robertson, M.D.V., Nashville, Tenn.; Chas. Wm. Wattam, 271 Court avenue, Memphis, Tenn.; H. H. Edwards, Lewisburg, Tenn., and Adolphus Wm. Waldron, Tullahoma, Tenn. The four applicants were admitted to membership in the association.

Election of officers for 1911 resulted as follows: President, Dr. Geo. R. White, Nashville; First Vice-President, A. O. Kennedy, Columbia; Second Vice-president, L. T. Lewis, Gallatin; Secretary, A. C. Topmiller, Murfreesboro; Treasurer, J. H. McMahon, Columbia.

12 m., adjournment for luncheon; 2 p m., association reassembles.

PAPERS AND DISCUSSIONS.

"Parturient Palsy," by Dr. A. E. Robertson, Nashville; "Eradication of Contagious and Infectious Diseases," by Dr. J. A. Kiernan, U. S. Veterinary Inspector in charge, Nashville; "Meat Inspection in Tennessee," by Dr. Willis B. Lincoln, Nashville; "John's Disease," by Dr. Joseph Plaskett, Nashville; "The Foot, Its Wounds and Treatment," by J. B. L. Terrell, Dresden; "Case Reports," by Dr. A. O. Kennedy, Columbia, and "The Forty-seventh Annual Meeting of the A. V. M. A.," Dr. G. R. White, Nashville.

After the installation of officers the following committees were appointed by President White: Executive Committee—F. R. Youree, chairman; Joseph Plaskett, W. L. Coplin. Legislation Committee—G. B. Giltner, chairman; Julius W. Scheibler, M. Jacob. Finance Committee—A. E. Robertson, chairman; H. H. Edwards, J. B. L. Terrell. Resolutions Committee—O. L. McMahon, chairman; J. B. Edwards, Frank B. Moore.

At 8.15 p. m. the members and visitors attended a theatre party as the guests of Drs. White and Plaskett.

SECOND DAY, NOVEMBER 4—CLINIC.

The clinic was held at the private infirmary of Drs. White and Plaskett, 24 Bridge avenue. The following operations were performed: Caudal myotomy, Dr. G. B. Giltner, Murfreesboro; X-ray demonstration, Dr. Jos. L. Taylor, Nashville; casting, Dr. J. B. Edwards, Fayetteville; simple abscess, Dr. O. L. McMahon, Columbia; eversion of uterus, Dr. Joseph Plaskett, Nashville; spaying bitch (Jacob operation), Dr. A. C. Topmiller, Murfreesboro; John's disease (clinic), Dr. Joseph Plaskett, Nashville;

bursatta (two cases), Dr. Jos. Plaskett, Nashville; spaying bitch, Dr. Geo. R. White, Nashville; removal of water bag, Dr. Geo. R. White, Nashville; castration four-year-old stallion, standing operation, Dr. Geo. R. White, Nashville; castration five-year-old stallion, standing operation, Dr. O. L. McMahon, Columbia; arytenectomy, McKillip's operation, Dr. Geo. R. White, Nashville; pectoral fistula, Dr. G. B. Giltner, Murfreesboro; cunean tenotomy, Dr. G. B. Giltner, Murfreesboro; peroneal tenotomy, Dr. G. B. Giltner, Murfreesboro; trifacial neurectomy, Dr. Geo. R. White, Nashville; median neurectomy, Dr. A. C. Topmiller, Murfreesboro; demonstration of electrical power floating, Geo. R. White, Nashville; ligation of vena saphena major for bog spavin, Geo. R. White, Nashville.

The next meeting will be held in Columbia some time during the month of October.

A. C. TOPMILLER, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular meeting was held in the lecture room of the New York-American Veterinary College on Wednesday evening, November 2, with the president, Dr. E. B. Ackerman, in the chair. There was a good attendance of members and visitors.

After some routine business had been transacted, Dr. J. F. De Vine, Chief Veterinarian of the New York State Department of Agriculture, addressed the association on "The Department of Agriculture and the Veterinary Profession." Dr. De Vine spoke of the recent legislation of interest to the veterinary profession, pertaining to the control of some of the infectious diseases, particularly glanders, tuberculosis and rabies. At the conclusion of the address many of the members availed themselves of the opportunity to question the speaker; and some matters pertaining to the subject, and not brought out by Dr. De Vine, were then explained by him.

Dr. Chas. S. Chase, then followed with a well-written and interesting paper on "Some Modern Methods in the Treatment of Disease." He spoke of the progress recently made in the treatment of infectious diseases, especially along the lines of preventive medicine, which he believed was only in its infancy.

Dr. Geo. H. Berns presented a large tumor, weighing several

pounds, which was successfully removed from the mammary gland of a sixteen-year-old mare. This tumor had a history of some eight years' growth.

Dr. Berns also reported on the case of a dog which died of acute enteritis, and an autopsy showed a large Haemorrhagic Infarction of the spleen. This spleen was shown to those present.

Dr. Gill moved that a vote of thanks be extended to Dr. De Vine for coming to address us, which was heartily seconded and carried.

Drs. Chase and Berns also received a vote of thanks for their excellent contributions to the programme.

Drs. Gill, Ellis and Blair were appointed a committee to draw up resolutions recommending the establishment of a Veterinary Bureau in the local health department. Meeting adjourned.

W. REID BLAIR, Secretary.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held at the Elwood Hotel, Waterville, at 7.30 p. m., October 12, 1910. The meeting was called to order by President Joly, and roll call showed the following members to be present: Drs. Salley, Lord, Joly, F. E. Freeman, E. E. Russell, F. L. Russell, W. S. Mebane; H. L. Stevens, W. H. Lynch, W. L. West, A. L. Murch, C. T. French, C. H. McGillicuddy, C. F. Dwinal, C. W. Watson and C. L. Blakely.

The minutes of the July meeting were read and approved.

The report of the Legislative Committee was read and showed considerable work to be done during the coming legislature. The application of Dr. Crosby French, of Rockland, having been favorably reported upon by the executive committee, the doctor's name was balloted upon and he was declared unanimously elected a member and was escorted to the room by Drs. Freeman and West, and he signed the by-laws.

The Banquet Committee reported making good progress towards a banquet in January, with an entertainment that will be pleasing to all who attend.

Dr. I. L. Salley, of Skowhegan, read a paper entitled "Rheumatism." The subject was carefully looked into and the paper contained much food for consideration. Dr. Salley was voted the

thanks of the association for the masterful way in which he presented his paper. Discussion followed.

Dr. H. L. Steven, of Rockland, read a paper entitled "Retrospection and Prospection of the Veterinary Profession in Maine." Discussion followed, after which a vote of thanks was given the essayist.

Dr. A. Joly, Waterville, read a report on the milk supply of Waterville. Voted to meet in Augusta, January, 1911.

Meeting adjourned 11.30 p. m.

C. L. BLAKELY, Secretary.

SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY.

This society held its first meeting of the year on October 7th. This meeting was given over as a reception for the entering class. The freshmen were given an opportunity to sign the constitution and become members of the society. Thirty men availed themselves of this privilege. Songs were sung and refreshments served by members of the society.

The society met again on October 28. Four papers were read by members of the senior class. Each paper was discussed by the members and a number of valuable points in diagnosis and treatment were brought out.

C. P. FITCH, Cor. Secretary.

CORRECTIONS.—Three typographical errors occurred in the November number, all in "fillers" on which we had no opportunity of passing after they were set up. On page 235 the compositors, finding the article a line too long, removed one which should have remained between the second from the bottom and the third from the bottom, and following the word "He," which now stands alone, should have read, "He graduated in the class of 1904 at the University of Pennsylvania," etc., etc. On page 203, in naming the officers of the Chicago Veterinary Society, E. L. Turtman should have been E. L. Quitman if printed according to the copy. On page 220, B. S. C. after James B. Paige was written B.Sc., and should have been so printed.

NEWS AND ITEMS.

JUST as we were closing our forms we received word from Secretary Marshall, of the A. V. M. A., that the dates fixed for the 1911 meeting at Toronto, are August 22, 23, 24 and 25.

DR. A. B. McCAPES was appointed Food and Dairy Inspector for Boulder, Colo. Boulder has just recently fallen in line and enacted an ordinance of this kind.

THE Veterinary Medical Association of New Jersey will hold its annual meeting at Trenton, January 12, 1911. Election of officers and an attractive program will be the features of the meeting.

DR. JAMES L. ROBERTSON, New York, who has been ailing since August, and very sick since the middle of September, has become sufficiently convalescent to make a trip to Ohio, where he hopes to recuperate in the country surroundings.

THE many friends of Dr. J. G. Rutherford, Veterinary Director General and Live Stock Commissioner of the Dominion of Canada, will be grieved to learn that he has been confined to his house under the doctor's care, through illness, practically ever since his return from the National Convention at San Francisco.

PRESIDENT GLOVER, of the A. V. M. A., has just completed the arduous task of making his appointments for 1910-11. In our November issue we printed the list of committee appointments, *except* the "special committees" which we have just received, together with the resident state secretaries, which we regret arrived just one day too late to be published in this issue. They will appear in the January number. In his letter of transmittal, President Glover stated that he had been in bed for three days, but did not mention whether it was due to the making of the formidable list of appointments he enclosed. However, he hoped to meet his turkey at Thanksgiving dinner next day.

AMERICAN VETERINARY REVIEW.

JANUARY, 1911.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, November 15, 1910.

MALIGNANT TUMORS. This is a very interesting subject, which occupies in comparative pathology a very important place, although it is, comparatively speaking, only recently that valuable bibliographic documents have been published. The field has taken such a wide extent and the investigations have become so numerous and important, through the rich production of elements for study which veterinary schools have offered, that to-day veterinarians are in possession of documents relating to malignant neoplasms among domestic animals, which are given to them by many professors of the schools, where their laborious investigations have found abundant material.

Prof. G. Petit, of Alfort, who for years has given special attention to the study of cancer and similar neoplasias, and has gathered a most interesting and rich collection of preparations relative to this subject, has published in the *Recueil de Médicine Vétérinaire*, a very valuable article which he has entitled "Generalities on the Malignant Tumors of Domestic Animals," and which, although it contains but generalities, illustrates facts and offers conclusions of immense value.

First of all, he advances what he considers a fundamental conclusion, viz.: The Cancer of Animals is Essentially Identical to the Cancer of Man—there is no essential difference between them.

Cancer is as frequent in domestic carnivorous animals as in man; in dogs more than in cats; but this does not prove that cancer might be a function of alimentation, as suggested by some. Herbivorous animals are frequently affected with cancer. A common and banal discovery in horses, it is also found in cattle, and if the observations relating to its presence in sheep, goats and pigs are but few, cancer does exist nevertheless in them also. Cancer has been found in rabbits and in fowls. Petit has not studied tumors of reptiles nor of fishes, but he nevertheless believes that cancer can and may affect the Totality of All Living Animals.

All the varieties of malignant tumors have been found in animals as observed in man, and if the age has but a small influence—although more commonly observed in individuals of certain age rather than youth—there is no scientific evidence either that sex has any influence; with the exception only of tumors of the mammae which in carnivora are found, extremely frequently affected with it.

Chondromas have been found in mammalia and birds. Teratomas, Chondro-Sarcomas, Lymphadenomas, and indeed all the anatomical and histological varieties, of malignant tumors have been met with in animals. And the General Identity of Malignant Neoplasms in All Species is a fact that all comparative pathologists admit to-day.

The theory of the heredity of cancer is at present losing considerable of its ground among its advocates, as there is No Positive Observation of the Hereditary Transmission of Cancer in Animals, and All the Attempts Made to Transmit the Cancer of Man to Dog, of Dog to Dog, of Dog to Rabbit or Fowl, Have Constantly Failed. Even the attempts to graft cancer upon the affected individual himself have also failed.

Yet, there exist few incontestable facts of successful graftings, spontaneous or experimental, of his own cancer to one cancerous individual.

The same remarks can be made in relation to the *contagiousness*, in domestic animals at least. Of course, the facts estab-

lished in relation to the cancer of mice are different; as inoculable and contagious as it is and has been proved to be, it is altogether peculiar and the conclusions to be derived from it are far from being applicable to the cancer of other species.

In relation to the Pre-Cancerous State, Considered in Animals, Petit says that the proof has been made that, in animals as in man, adenomas, which it is known are ordinarily connected with chronic inflammation, give a good evidence that a pre-cancerous state must also be admitted in animals.

* * *

Numerous examples of primitive malignant tumors of most all the organs have been observed by Petit.

In the *locomotory* apparatus, Fibro-Sarcomas, Osteo-Sarcomas, and Epitheliomas of the jaws have been seen in horses and in dogs; Chondromas of the ribs in cattle.

In the Digestive Apparatus, Sarcomas and Epitheliomas of the intestine have been observed in dogs. Primitive Cancer of the Tongue or of the Jaws are recorded. Parotid Epithelioma, Branchial Epitheliomas in a dog and in a mare. Cancer of the Liver in the various domestic animals. Cancer of the Pancreas is less frequent. Lymphadenomas of the Small Intestine have been seen.

In the Respiratory Apparatus, Pulmonary Epithelioma is frequent in dogs.

In the Genital Apparatus, Cancer of the Vagina, of the Uterus, of the Ovaries and of the Oviducts have been exclusively found in sluts. In the Mammae, especially of dogs or cats, all the so numerous varieties of benignant and malignant tumors found in man may be met with in animals. In Males, the Cancer of Chancroid of the Penis of horses is absolutely identical to that of man. The Sarcoma of the Sheath and Penis, the Sarcoma and oftener the Epithelioma of the Testicle are as frequent as the Teratoma of cryptorchid horses.

In the Urinary Apparatus, Sarcomas and Primitive Epitheliomas of the kidneys have recently been found in horses and

Suprarenal Epithelioma has been observed in herbivorous and carnivorous animals as well. Cancer of the bladder is not rare either in herbivora or carnivora.

In the Thyroid Apparatus, Thyroid Cancer has been seen in horses and dogs, and also one case of *generalized* Parathyroid Cancer in dog.

This enumeration covers only the malignant tumors most frequently observed by Petit in animals, exclusive of many others which, mentioned by other pathologists, tell of the great frequency of those neoplasms in domestic animals.

To resume the entire conclusions of his generalities, Prof. Petit says:

1. Whether it is considered in its pathogeny, its evolution, its macroscopic or microscopic characters, cancer of domestic animals is identical to that of man.
2. It is observed specially in carnivora, but herbivora are not exempt from it no more than omnivora, rodents and even birds; facts from which it results that cancer is no doubt susceptible of affecting, with at least some modifications, all vertebræ.
3. Known statistics of cancer among animals, without having an absolute histological value, are sufficient to demonstrate how frequent it is.
4. The various categories of malignant tumors observed in man (epitheliomas, sarcomas, sarco-epitheliomas, chondromas, lymphadenomas) are found in animals with varied aspects. The shortness of life in animals does not allow of its establishment, as easily as in man, the influence of age nor the one less precise of sex, yet cancer is no doubt more frequent in the second half of existence of the individual.
5. There is no fact, well observed in comparative pathology, supporting the theories of heredity or contagiousness of cancer.

6. There is in animals a Pre-Cancerous State comparable to those which have been mentioned as existing in man, and they are probably even more common. They are represented specially by Chronic Inflammation, Parasitic Lesions (bots, acarians, cys-

ticercus, etc.) and Adenomas (thyroid gland, mammae, liver, mucous membranes, etc.).

7. In relation to the origin and primitive seat of malignant tumors, the data taken from human pathology agree exactly with those of comparative pathology.

* * *

ÆROPHAGY—SIALOPHAGY. Lately ærophagy has been the subject of many interesting communications, and to-day the history of this affection is widening considerably.

The term of *Ærophagy* is comparatively of recent origin. created by Bouveret in 1891, it designates the action of allowing the entrance, willingly or otherwise, of a certain quantity of air in the superior digestive halls (*œsophagus* or *stomach*). However, it is only since 1901 that the word was admitted in medical phraseology and recognized as the ordinary cause of those so-called tympanitic or flatulent dyspepsias.

But the presence of a certain quantity of air in the digestive tracts, especially the stomach, says Doctor G. Schreiber in the *Presse Medicale*, is not always the indication of a pathological fact. If with radioscopy a normal subject is examined, either with an empty stomach or after a meal, there will always be found in the superior part of the gastric pouch a clear spot, revealing the atmospheric air which will have penetrated in the stomach by deglutition.

Physiological ærophagy is met with at all ages, even in nursing babies, and when the intragastric tension resulting from it becomes too strong, the stomach relieves itself automatically of the superfluous air; the cardia opens and an eructation takes place. To the clinical point of view, if a sufferer is interrogated, he will say that those eructations come in series, one or several times a day. And if he is asked to show you one of these attacks, he will bend himself slightly forward, stop speaking, close his mouth, lower the head and then bring out wind; first in small quantity and at intervals apart from each other, and then more frequent, loud, and perhaps improper. In fact during

the first step, when the mouth is closed, the man swallows a certain quantity of air instead of throwing out some. It is he who promotes the crisis and repeats it at his will.

All ærophages are not alike. With the ærophagy by deglutition, which may be noiseless or loud, there is the ærophagy by aspiration. And according to the depth in which the air has penetrated in the digestive tracts, there is recognized a pharyngo-oesophageal, or, again, a gastric form. And then again, carrying the division further, in human pathology there is the distinction of some ærophagies, such as when there is no buccal expulsion and where the introduced air passes through the pylorus into the intestines and gives rise to gaseous distension of the abdomen. Or, again, there are dramatic, severe ærophagies which may assume such characters as to appear as cases of angina pectoris, acute asthma, cardiac dyspnoea or uræmia.

The symptoms, diagnosis and prognosis of this affection are undoubtedly justifying the attention of physicians, and in relation with the above consideration of the subject the study of comparative pathology on the simple non-eructating or dumb ærophagy or sialophagy of horses made by Lieutenant-Colonel Pecus, army veterinarian, will prove interesting.



If the loud, spasmodic ærophagy or redhibitory crib-biting of horses is well known, at least from the symptomatic point of view, it is not the same with sialophagy, or the simple ærophagy, the one without eructations.

Simple ærophagy, or noiseless deglutition of an exaggerated quantity of air is characterized by deglutition of saliva, which are the causes of an abnormal arrival of air in the stomach. Simple ærophagy has its origin in the increase of the salivary secretions. The ptalism is abundant between the deglutitions, hence is justified the expression of Sialophagy, or ingestion of saliva.

While a healthy horse, in full state of digestion, may remain more than 20 minutes without having a salivary deglutition or

making chewing motions of the jaws, the sialophage animal chews constantly, gabs and swallows his saliva repeatedly. The sialophage horse is a curious one to watch, as its features are typical. Indeed, when the salivary secretion is sufficiently abundant, he closes his lips to hold it in his mouth. Then he has chewing motions of the jaws and swallows. He then stops, remaining quiet for a few seconds or one or two minutes and then goes over the same process again. To observe these symptoms well, says Mr. Pecus, one must examine the horse preferably half an hour or one hour after the end of a meal. If the manger or rack are clean and the bedding cannot be reached, the horse will soon begin his ordinary vicious habit.

All these are generally preceded by a licking, more or less active, on the manger, then a few chewing motions of the jaws; the cheeks become fuller, so as to form in the mouth a ball of air which is then swallowed with more or less saliva; there is no noise, no eructations. It is the noiseless crib-biting.

What becomes of the swallowed air? Not being permitted, as in man, to be rejected through the oesophagus, it goes in the stomach, which becomes dilated; or, again, passes in the intestines and gives rise to borborygms and tympanitis.

Sialophagy is a complication of old gastritis, and the ptyalism proceeds from a reflex action, having for starting point the gastro-intestinal terminations of the pneumogastric. A predisposing cause to this habit is the sedentary life of the horse and its being attached, secured to the hay rack. The severity of sialophagy rests entirely in the nature of the digestive trouble that accompanies it. It may improve and get well by proper hygienic measures; anti-cribbing collars are very essential and above all freedom in a box-stall.

The most serious question of simply ærophagy is that it often changes and becomes eructating and makes true wind-sucker invalids, as they are denominated by veterinarians.



A SPECIFIC DISEASE OF HERBIVOROUS ANIMALS IN SOUTH AMERICA. MM. Rivas and Zanolli have published in the *Revista*

de la Facultad de Agronomia de Veterinaria de la Plata an interesting study of a specific disease of herbivorous animals in the region of the Andes, which is known in South America under the name of "Tembladera," and which affects horses, cattle, sheep and goats. It prevails extensively in the northern parts of the Argentine Republic, Bolivia, Chili and Peru. A concise account is here presented, extracted from the *Revue Generale*.

The authors have divided the series of symptoms into three periods: In the *first*, which lasts one day, the symptoms appear from 6 to 10 hours after the ingestion of a plant, the "Festuca," and consists in slight fibrillar contractions of the gluteus, triceps brachialis, quadriceps cruralis, and pectoralis muscles. The back is arched, the coat erected and the animal has a dull appearance. He is said to be *picado* (touched). All the principal functions are still normal. After a few hours there are swinging motions of the body, either in lateral or longitudinal direction. They are very slight and quite difficult to make out. There is general hyperesthesia and pressure over the vertebral column or sacro-lumbar region is readily felt by the animal. The digestion, circulation, urination and intellect are normal.

The *second* period is essentially characterized by marked exaggeration of the swinging of the body, the animal is *machado* (drunk). He makes great effort to stand, is constantly moving on his legs to keep his equilibrium. He rushes forward to almost drop on his nose, or suddenly backs on his hindquarters so as to sit on his rump, or, again, balances his body sideways, standing on one lateral biped. It is not rare to see him with his four legs stiff and wide apart so as to widen his whole base of sustentation. There is also great constipation, yet no fever, no disturbance in circulation nor respiration. Great retention of urine is a constant manifestation which requires the use of a catheter to be relieved. The muscular contractions are stronger than in the first period and sometimes have a clonic character. The hyperexcitability is always very great.

After a length of time varying between 2 and 7 days the *third* period begins. The animal remains lying down, struggles much

with his legs, his tail is constantly agitated. There are intermittent contractions of the superior and inferior cervical muscles. The animal moans, curves his spine and his legs are very rigid. Later there is general debility, the pulse becomes very accelerated—over 100 to the minute—but the respiration remains normal. The temperature which at the beginning of this period was low, runs down rapidly to 30° , 35° , or even 34° , when death takes place after an agony lasting more or less. This period lasts from 1 to 3 days.

* * *

The lesions, experimental studies and the treatment complete the article of MM. Rivas and Zanolli.

The subcutaneous connective tissue in some parts of the body is infiltrated with sero-bloody infiltration, due to the knocks and rubbings that the animal has inflicted to himself during the process of the disease.

The apparatus of locomotion presents nothing abnormal, neither do the organs of the thoracic cavity.

In the abdomen, the peritoneum and the cavity are normal. The stomach contains some undigested food. The mucous membrane of the right sac of the organ is slightly catarrhal. The small intestine and especially the jejunum have many congestive spots. The mucous membrane of the cæcum and large colon shows few small haemorrhagic spots. The small colon contains soft excreta. Its mucous membrane is normal. All the organs of the abdominal cavity are free from lesions. The urinary bladder is always found containing a large quantity of urine.

The nervous centres seem to show the principal lesions. The cephalo-rachidian fluid is normal. It only contains a few rare lymphatic globules. In quantity there is generally more than 100 c. c. In opening the cranial cavity the brain is seen contracted, pale, but otherwise normal. The choroid plexuses, as well as the cerebral and cerebellar, are slightly anemic. The rachidian piamater is congested. The histo-pathological examination revealed nothing abnormal.

In their experimental study of the disease the authors inquire into four questions: 1. If the tembladera was contagious. 2. If it was transmissible. 3. If the micro-biological study could give some information as to its nature, and 4. In what condition did the disease occur.

Their researches have brought them to the discovery that the disease is due to the ingestion of a graminous plant, the *Festuca Hieronymi*, and by no other plant that constitutes the food of animals. But what was the toxic influence of this plant is yet to be found out, as by analysis no alkaloid or other compound could be found. All that could be obtained was the presence of a parasitic mycelium which gave a glutinous substance, special fungus, to which the authors gave the name of *Endoconidium Tembladeræ*.

The treatment suggested is very simple.

To prevent the disease is not to allow the plant to enter into the food of animals, or to destroy it in the fields where it grows. To cure animals affected with it, strong purgatives are the indications. Bromhydrate of arecoline, pilocarpine or eserine will cure even animals already at the end of the second period. Yet a general debility, some muscular contractions and swinging motions of the body may remain for a short time afterwards.

* * *

APONEUROTIC GRAFTINGS. Cutaneous graftings have remained for a long time the only ones resorted to in surgery, but after a while the method took extensive development. Organs and most varied tissues were grafted and from experimental attempts soon entered general practice with more or less success. Evidently, with such progress, it was indicated that tendons and aponeurosis were sooner or later to take their place as important agents in surgical arsenals. Of course, it was to be feared that their weak vitality would cause numerous failures; their structure of dense, fibrous tissues, their limited vascularization, are not favorable conditions for grafting, and daily experience has

shown how easily necrosis takes place in those tissues when they are exposed to infection.

But these were only theoretical fears, and experimental as well as clinical facts have proved that the transplantation of tendons and of aponeurosis, when done under Perfect Asepsy, can succeed, and according to Kirschner, "tissues thus transplanted can remain in perfect condition of life for months and keep their characteristic structure."

This surgeon has indeed performed successfully tendinous graftings. But his studies were principally directed in the use of aponeurotic strips. Easily taken from any superficial aponeurosis these strips form a material for grafting of superior quality, which can be obtained readily, even in large quantity, and can be used either in elongated bandelets or in wide sheaths for all varieties of tendinous autoplasties. With them broad loss of tissues can be closed. Their thinness is a warranty of easy nutrition, their elasticity is superior to that of tendons and their resistance is very great. The experiments of Kirschner have given great and constant good results, and the transplanted aponeurotic pieces have always remained living and have adapted themselves to their new functions. In one dog the entire thickness of the abdominal walls had been resected, except the peritoneum and the skin. In its place a quadrangular aponeurotic piece, taken from the fascia lata, had been inserted, and the dog recovered without having any eventration.

The method has made great progress, especially among German surgeons, and the possible applications of the new agent are very numerous—tendinous autoplasties, reconstitution of articular ligaments, making up of the walls of cavities of the body such as the abdominal, the peritoneum, articular capsular ligament, reinforcing imperfect or weak sutures such as the tendinous, those following laparotomy and especially in rebel hernias, etc.

Among some of the many where it has been employed, which have been recorded, there are: The transplantation of a muscle to a new insertion; to prevent the reproduction of pathological adhesions between neighboring tissues; as a means of consolida-

tion of sutures; to secure and fix the urinary bladder in a given place after laparotomy; to close a large wound of the abdominal wall through wide loss of tissue; to constitute a material of structure strong and resisting, etc.

From these brief extracts it is shown that, at least in human surgery, the use of aponeurotic structure has a wide field of opportunities. What may these be in veterinary surgery? Perhaps very much more limited as far as that of large animals is concerned, but there are, nevertheless, many instances where that of smaller animals can find indications of resorting to the advantages that are laid down and recorded in human surgery.

* * *

AN EPIDERMIS PROLIFERATING AGENT. Under the name of Scharlach-rot, or again of Scarlet Rot, a German preparation has been recently used quite extensively in human surgery as a keratinizing agent, upon which an army veterinarian, Mr. Picard, in the *Revue Generale* called the attention of the veterinary profession on account of the advantages he has derived from its use.

The Scharlach-rot is the amadoazotoluolazo-B naphtol and is the result of the action of the Naphtol-B upon the diatozed amadoazotoluol. In a state of purity it is a powder of a dark, reddish-brown color, insoluble in water, easily soluble at a boiling heat in alcohol, acetone, ether and benzol. At ordinary temperature it dissolves in chloroform in the proportion of 1 to 15. It easily dissolves also in fats and oils and by heat in vaseline and paraffine. First used for coloring microscopic preparations, it is only recently that its therapeutic value has been found in the treatment of wounds.

In Germany, Schmieden experimented first with it; then Fisher and others. In 1909 Helmholtz in America published an important article under the heading of "Experimental Epithelial Proliferation of the Skin and Mucous Membranes." Yet it is Schmieden who was the first to resort to it for the treatment of

granulating wounds. Then came others who followed his example in Germany, America, France, etc.

It is after having witnessed the results obtained by some surgeons and principally in the case of a very large burnt wound of the thighs of a man, that Mr. Picard decided to try it. And he relates the following case:

A mare had received a bad injury on the right posterior leg, involving skin, subcutaneous tissue, and dividing incompletely the tendons. Notwithstanding all kinds of treatment and dressings there remained back of the tendons a very hard, fibrous tumor as big as an orange, and no complete cicatrization could be obtained. There was besides the ugly sore an abundant discharge running from it. Another attempt had been made by making two long cutaneous incisions on each side of the growth, dissecting and removing it. The edges of the wound, which was quite large, had been brought together with closely applied sutures, and a dressing covered the whole. Soon the mare objected, threw the dressing off, the stitches broke and there remained an enormous wound, gaping, of bad appearance, and not granulating.

Then Sharlach-rot treatment was begun.

After complete disinfection, some ointment of Sharlach-rot was spread on a piece of gauze; this was laid over the wound and kept in place with a bandage just tight enough to hold it in position and so that the mare could not object to it. This dressing was changed every two days. After one week the process of epidermization was very plainly noticed on the edges of the wound. Cicatrization had begun and progressed. After a few days it seemed as if there was an arrest. The Scharlach dressing was left off for a couple of days and then taken up again, with the result that in one month from the time the treatment was begun, recovery was complete. Since this success Scharlach-rot has been used with wonderful success in broken knees, in granular dermatitis, in varicose ulcers, in scratches, and in all kinds of cutaneous chronic sores or wounds.

The ointment recommended is one made of 5 per cent. The most practical way to prepare it is to dissolve the Scharlach in

chloroform, and when this has evaporated, add vaseline and mix well.

It ought to be tried!

* * *

ANAPHYLACTIC SERIAL ACCIDENTS. In his opening address to the Congress de Médécine which was held here on the 13th of last October, the president, Prof. Landouzy, well known to those of our readers who went to the International Congress of Tuberculosis in Washington two years ago, said: "The anaphylactic state is no less mysterious than that of immunity, and alone pathological physiology has permitted Charles Richet to establish that fecund law which put modern pathology and therapeutics in endless suggestions. Neither the most powerful microscope nor the finest chemical analysis can explain the state of sensitization of anaphylactized subjects."

But yet investigators and experimentors are searching, if not the explanation, at least the means to overcome the accidents met in it and are trying to find better practical applications than those that are already known.

The *Centralblatt für Bakteriology* has published contributions relating to this important problem by A. Fonteyne, but the methods spoken of are difficult of application.

In one, leaving aside the sure method of the heating process at 100 degrees during 15 minutes, which has the objection that it destroys the immunizing properties of the serum, he proposes the mixture of serum of rabbits treated with serum of rabbits, guinea-pigs or horses. Or, again, in a second, better instead of mixing two sera anti, a mixture is recommended of serum of guinea-pig with a serum of horse, viz.: a foreign serum and the homologous of the species to be tested. The mixed serum, horse-serum of guinea-pig, in equal proportions, after a contact during 8 days, is free from anaphylactic toxicity.

At a late seating of the Society of Biology, MM. Carnot and Slavu have presented another new method by which accidents of serial anaphylaxy can be avoided. Its simplicity recommends

it. They recommend the use of an extemporaneous mixture of the serum to inject, with a given quantity of muriatic acid. This addition prevents the production of anaphylactic accidents in hypersensibilized guinea-pigs, without interfering with the anti-toxic properties of the serum. It is sufficient to add the acid in the proportion of 3.3 per 1,000.

Whether this method would give similar results in the prophylaxy of serial accidents remains to be demonstrated.

* * *

BIBLIOGRAPHIC NOTICES. I have received among our exchanges two special issues, for which with my thanks I may be permitted to give a little more notice and offer my welcome.

The first, to which I believe I have already alluded, is the *Revista de Medicina Veterinaria* of Montevideo, and the second the October number of the *Annales de Médecine Vétérinaire* of Belgium.

In the *Revista*, which was accompanied by several of its subsequent issues, there is the announcement of the Veterinary School of Montevideo, with our good and truthful friend, Dr. D. E. Salmon, as director. This number is handsomely illustrated, and the general program of the school tells that veterinary science is certainly going to assume in Uruguay the place it ought to occupy when are taken into consideration the immense interests which are engaged in that country. Among the interesting contents of the eight first numbers of the *Revista* issued, there is a lengthy and valuable contribution on "Contagious Diseases, Piroplasmosis, Scabies and Bacteridian Anthrax," by Director Salmon.

The October issue of the *Annales of Bruxelles* had to be what it is, viz.: a special number! Ordinarily the monthly issues of this journal, rich as they are in their excellent and valuable contents, have the ordinary aspect of similar publications. The special number for October is more than twice its ordinary size

and, although it differs in its contents from the others, it is one that will meet with great success.

In it indeed is related the magnificent ceremonies that took place for the inauguration of the new Governmental School of Veterinary Medicine at Cureghem es Bruxelles, and of the great meeting of the Belgian Veterinary Federation, with also a full description of the grand festival attached to the ceremony.

The history of the school is given in full in the speech made by Director Dupuis, who, besides the general program of studies carried out, now gave a brief biographic sketch of several of the professors and directors who, since the foundation of the school in 1794 to our day, have illustrated that institution.

The number contains a series of numerous plates which give a very good idea of the general disposition of the new school, which covers a surface of four hectares—say about four acres—two of which contain no less than nineteen buildings for the various departments, laboratories and services necessary to carry out the work which is expected from the learned faculty.

Herenfore, I think, foreign visitors of continental veterinary schools were satisfied with Alfort, Berlin, London or a few others, but now they will have to add Bruxelles to their program as one among the most important and the finest schools of old Europe.

* * *

To close, let me acknowledge the receipt of "Transactions of the Nineteenth International Veterinary Congress at the Hague," forming Volume III., and containing documents relating to the organization of the Congress, the opening and closing meetings, and the *résumé* of the general meetings. This is to be followed by a Volume IV., where the proceedings of the meetings of the sections will be presented. It will complete the entire history and work of the grand meeting in Holland.

A. L.

THE REVIEW, 1910—BRIEF RESUME.

The many expressions of appreciation of the quality and high character of the REVIEW, that are wafted in with every mail, has led us to believe that it might be interesting to our readers, who are "the veterinarians of America" (with few exceptions), and a goodly number of those of every civilized country of the world, to see grouped together in a condensed form a list of the good things the REVIEW has given them during the past year, that has caused them to vote it "at the top in veterinary journalism in America," to state "its position in the field of current veterinary literature is assured"; and to say of it, "the REVIEW is at once progressive and conservative"; and many, many other things that we will not take space to reiterate here. As neither of our two yearly volumes begin or end with the year, we cannot refer to either of them in a yearly report, but will present as briefly as possible the matter contained in the twelve numbers from January, 1910, to December, 1910, inclusive.

We have during that period, given our readers nearly sixteen hundred pages of reading matter. The editorial section devoted to *European Chronicles* has dealt with eighty distinct scientific subjects that have been gleaned from the current veterinary and other scientific literature of Europe, that has been carefully read and placed in a concise form in English, ready for digestion by our American and other English readers. We have published ninety *Original Articles*, including those from the most advanced veterinarians and scientists in America. We have published eighty-one *Case Reports* from American veterinarians, and one hundred and eighty-three others of the most interesting character, in a condensed form through our *Abstracts From Exchanges*. Our original articles and case reports have been illustrated by seventy-three cuts. We have given full reports of the proceedings of sixty-seven *Society Meetings*; published twenty-eight communications to the veterinary profession through our *Correspondence Department*, and ten impor-

tant communications relative to army veterinary matters through our *Army Veterinary Department*. In addition to the above statistical data, we have published thousands of news items, some bearing a social aspect, and many, many others carrying important matters of news to the profession, and frequently valuable information gleaned here and there from our large list of exchanges.

This being our first number in 1911, and coming out somewhat later than has been customary, we do not wish to give the impression that that is to be a new feature established with the new year, but will explain it by the fact that our editor has been ill for the two weeks in the month when his presence was most needed, and that most of his work on the present number has been done in his room, some of it in his bed. However, we hope the number will "pass muster," and wish you all a "HAPPY NEW YEAR."

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CHRISTMAS EDITIONS OF AGRICULTURAL PAPERS.—It seems but yesterday that we were reveling in the Christmas number of the *Breeder's Gazette*, of 1909, but the sight of the last beautiful Christmas edition, with the sweet-faced child, happy amongst the rich-colored ears of corn, on its front cover-page, reminds us that a year has slipped by since that time; and we are constrained to admit that the Holiday edition of 1910 is even handsomer than that of a year ago.

The *Farmer's Advocate* has also entered into the Christmas spirit as only Canadians can, and its Holiday number is a most splendid one. Its leading article by Dr. W. C. Murray, President of Saskatchewan University, on "Rural Education for the Canadian West," with a splendid picture of President Murray in the centre of the first page, is most interesting. The number all through is excellent. More than half of one of its large pages is occupied by "Pomes for Christmas."

ORIGINAL ARTICLES.

THE DIAGNOSIS OF RABIES.*

By JOHN REICHEL, V.M.D., PHILADELPHIA, PA., CHIEF OF THE LABORATORY OF THE PENNSYLVANIA STATE LIVESTOCK SANITARY BOARD.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

INTRODUCTION.—The terms rabies, lyssa, canine madness or hydrophobia are applied to a specific disease to which all warm-blooded animals are more or less susceptible. All of the terms except hydrophobia are appropriately applied to the disease in dogs and the lower animals in which the sum total of the usual symptoms at times is an expression of rage, madness or rabid condition. The dread of water as a symptom of the disease is expressed in the term hydrophobia, and as this symptom is not seen in animals, but in man, the appropriateness of the term of the disease is at once apparent.

Late in the eighteenth century a highly acute and fatal disease among dogs of Massachusetts near Boston was recognized as rabies and before the close of that century, rabies was also recognized in Pennsylvania. Since then it has been a matter of interest to note the spread of the disease from the East to the West, which has been most rapid during the last two decades, and the disease is now known to exist in every state in the Union. In the Eastern states, particularly New York and Pennsylvania, the disease has taken the proportions of alarming epizootics within the past two years.

Infection, under natural conditions, usually occurs following the bite of an infected animal, the saliva containing the specific

* Read before the Annual Meeting of the Pennsylvania State Veterinary Medical Association, Philadelphia, Pa., March 9, 1910.

cause or virus. Experimental transmission may be successfully accomplished by the injection of the portion of the brain tissue, spinal cord, saliva, supra-renal glands, lachrymal secretion, pancreatic secretion or milk of an animal with rabies. From the results of the inoculation of such material, it has been shown that the virus is present in the brain and spinal cord in its purest form and more constant in those tissues than in the saliva or the other secretions.¹ Accidental inoculation with the subsequent development of the disease may follow the penetration of slight and superficial wounds with saliva, etc., containing the virus. Symptoms do not immediately follow the bite of a rabid animal or injection of virus, but as in all infectious diseases, particularly those caused by protozoa, there is a period during which nothing unusual is observed. This period of incubation, *i. e.*, from the time of infection to the beginning of symptoms, varies in the different animals, depending upon the virulence of the virus, dose, seat of inoculation and susceptibility of the victim. The symptoms in the majority of cases are slow in developing, and as a rule an animal when attracting attention has shown symptoms for many hours, and not infrequently for a day or two. In that infected animals may show symptoms of the disease one or two days before the symptoms attract attention, the question naturally arises, how long before actual or noticeable symptoms is it possible for an animal developing rabies to transmit the disease by means of a bite or otherwise? Nocard and Roux have shown by experiment that the saliva of a dog is infectious at least three days before the dog shows symptoms of rabies, while in experiments conducted by the Athens (Greece) Pasteur Institute, the virus was demonstrated in the saliva eight days before the dog showed signs of the disease.¹ This conclusively demonstrates that the saliva may carry the cause of rabies, and that the presence of the virus may be demonstrated in the saliva before the animal shows premonitory or actual symptoms.

In establishing a diagnosis, the history, symptoms, gross autopsy findings and laboratory examination are all of importance, but are not all absolutely necessary in any one case, as at

times a clear history of the animal having been bitten some weeks previous by a rabid animal, and the subsequent development of characteristic symptoms following a period of incubation, may be sufficient for an accurate diagnosis. Then again, the symptoms and gross autopsy findings, without any history may be conclusive enough to suggest the possibility of the existence of rabies; and in such a case, the laboratory examination should be relied upon as well as in those cases in which the history and autopsy findings without the symptoms fail to be conclusive.

THE USUAL HISTORY.—The dog has for centuries been known to be the real carrier and most frequently afflicted of all the warm-blooded animals. The often repeated statement credited to Aristotle, who lived from 284 to 322 B. C., "Of these, Lyssa (rabies) causes mania, and whatever is bitten, of these bitten go mad except man"² is taken as evidence that rabies existed before the beginning of the Christian era, and strengthens the belief that dogs suffered from madness. Unfortunately, the observations of Aristotle were not thorough enough to note the transmission of the disease from dogs to man. In Russia the wolves are credited with harboring and spreading the disease. The dog and wolf are not any more susceptible to the disease than are other warm-blooded animals, but the dog through the freedom allowed and his habit of exchanging greetings and joining in combat with his kind and other species, exposes himself more to the chances of infection.

The popular belief that dogs are more apt to go mad or develop rabies in summer, particularly during the so-called "dog days"—the time of the year from July 3d to August 11th, when the "dog star," Sirius, is above the horizon with the sun—is not corroborated in referring to Table No. 1, in which it may be seen that during July and August the number of heads of animals suspected of having rabies received at the laboratory was not as large as in many of the other months during 1900 to 1909 inclusive.

TABLE NO. I.

Heads of Animals Received at the Laboratory of the Pennsylvania State Livestock Sanitary Board, 1900-1909, Inclusive.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1900.....	..	1	1	1	2	4	5	1	1	2	2	5
1901.....	4	8	2	3	12	2	3	3	3	7	4	4
1902.....	4	7	6	6	6	3	..	1	4	4	2	2
1903.....	3	3	2	1	3	6	..	6	4	7	3	9
1904.....	5	11	9	10	2	6	2	2	4	5	8	2
1905.....	6	9	13	7	7	6	8	5	7	8	7	8
1906.....	11	6	8	7	5	7	3	12	8	8	10	16
1907.....	10	11	5	3	12	9	9	6	9	11	14	9
1908.....	5	4	13	4	14	19	19	18	16	16	10	16
1909.....	22	7	32	20	14	32	12	18	18	20	33	33
Total by Months..	70	87	91	62	77	95	61	72	74	88	93	104

The largest number of heads were received during the months of November and December. As it is a fact that dogs do mingle more in warm weather; therefore, they are more exposed, and should infection take place, with its subsequent period of incubation of four to eight weeks before symptoms develop, the apparent increase in the number of heads during the months of November and December may be accounted for. With the spread and increasing prevalence of rabies, it must be recognized that dogs permitted to run at large, even for short periods at a time, may while at liberty, be exposed to a rabid animal. The owner of a suspected animal will not infrequently insist that this or that animal was not exposed; but in almost every instance some loophole in the confinement of the closest of pets can be discovered. It is well known how eagerly dogs seldom permitted to run at large join other dogs when granted that freedom, thereby increasing the chances of exposure in arousing a passing or sulking rabid dog. In gathering the history an attempt should be made to find out the day of exposure or time of infection. Not infrequently, as proof of exposure, a healing wound, the result of a bite, may be detected on some part of the body.

The period of incubation of rabies in the domestic animals including man is usually within the following number of days:

Man, 14 to 90 days.

Dogs, 14 to 60 days, authentic exception 365 days³.

Cats, 14 to 60 days.

Cows, 14 to 80 days.

Horses, 21 to 90 days.

Swine, sheep and goats, 21 to 60 days.

Birds, 14 to 60 days.

Rabbits, 9 to 90 days.

Guinea pigs, 8 to 60 days.

It is an exceedingly rare occurrence for man or any of the lower animals to develop rabies following the one hundredth day from the time of exposure or infection, but there are rare instances in which exceptionally long periods of incubation have been observed.

SYMPTOMS.—A careful study of the symptoms of rabies in the dog is of the greatest importance in attempting an ante-mortem diagnosis. The disease is acute in its course, and when symptoms are pronounced, death usually follows in a very high percentage of cases within several days. Pasteur, Roux and Babes are on record as having seen rabies in the dog with recovery after well marked symptoms had developed. These instances are exceedingly rare and should not detract from the general opinion that rabies is always fatal. In a personal observation of a large number of dogs suspected of having rabies, sent to the Veterinary Hospital of the Veterinary School of the University of Pennsylvania during 1906-1909 inclusive, not one dog lived more than eight days with symptoms of the disease.

Two types or forms of rabies are usually recognized—the furious or irritable and the paralytic or dumb. These forms or types are not sharply defined nor always separable. They are more correctly considered as stages of the disease because both are preceded by identical premonitory symptoms. The furious stage is usually followed by the paralytic stage; but not infre-

quently the paralytic stage may follow the premonitory symptoms with the omission of the furious stage.

PREMONITORY SYMPTOMS.—First a decided change in the disposition of the animal is observed. A lively and amiable dog may suddenly become dull; the quiet and unexcitable dog may become unusually alert, more affectionate, demonstrative and exhibit the desire to be caressed. A dog not in the habit of barking may bark frequently without any apparent reason and seem unduly disturbed without cause. The appetite is good and even excessive, and perhaps the animal may eat food as a rule not enjoyed. The increased friendliness is most striking, and other changes in the disposition may be detected. These symptoms may suddenly become more alarming, as the furious stage succeeds the premonitory symptoms, or the dog may seek quiet surroundings with the development of the paralytic or dumb stage.

FURIOUS STAGE.—The dog is increasingly restless. The muscles are firmer and more tense, particularly those of the limbs and back. He responds to the owner's call, but not quickly. The impression is that the dog has some trouble in locating the owner, but recognizes the voice as in health. Coakley has called attention to a symptom he considers pathognomonic, a fixation of the pupil of the eyes. In dogs confined in well lighted cages, the contracted pupil does not appear to be a constant symptom, and not infrequently one pupil is seen much contracted, while the other appears not at all affected. The eyes do appear to be somewhat limited in their movements, and along with the muscle firmness, there is a glary fixed expression. At this time it may be noticed that the dog in lapping seemingly exerts himself more than usual in attempting to drink water. The water when taken into the mouth mixes with the saliva and the constant movements of the jaw and tongue form froth. The desire to drink appears to be increased, which is quite natural with the inability to swallow, owing to a gradual and progressive paralysis of the muscles of the pharynx. The paralysis later extends to the jaw and tongue. With the paralysis well advanced, the dog is

not capable of swallowing, but the desire and attempt to quench the thirst does not abate. The dog will repeatedly plunge his nose into water and make a strenuous attempt to swallow, which at first only causes an increase in the flow of saliva with the formation of more froth. The drooling giving rise to the symptoms popularly known as "frothing at the mouth." Before the paralysis is complete the appetite becomes decidedly depraved, which is another characteristic symptom, as shown in the destruction and attempt to swallow straw, coal, wood or other foreign material. As the paralysis of the pharynx progresses, a significant change in the bark occurs, which is one of the most constant symptoms of rabies in the dog. Occasionally a dog will not bark and nothing will induce him to do so, although he may show all of the other symptoms of the furious stage. The bark in the premonitory stage may be the same as in health, but with the development of the furious stage, the bark is decidedly changed. Instead of a sharp and clear bark, the latter part of the note becomes prolonged and of a higher pitch. The inability to swallow is due to a progressive paralysis of the pharynx. This condition has often been mistaken for symptoms observed when a bone or other foreign body lodges in the throat, and has led many a sympathizer to investigate and thereby expose himself to possible infection. With the progress of the disease, the dog will start out and travel tremendous distances if unhindered. Wide rivers have been successfully crossed. There appears to be one desire uppermost within the beast, to go on and on. It is the rule that an attempt will be made to return home or to go to the original starting place. The appearance of the animal upon his return is worthy of mention. Emaciation is marked; wounds and blood mixed with foreign matter cover the body; the eyes are clouded and expressionless; the mouth is open owing to paralysis of the lower jaw; the tongue hangs loose and usually discolored; the mucous membrane is dry and the lips on the sides of both lower and upper jaws lie in close, changing the general appearance of the dog at times beyond recognition. The change in appearance is a striking one and is as character-

istic as the alteration of the bark. Paralysis of the hind limbs rapidly extends forward, and it is a race between the progressive paralysis and death, whether or not the paralysis will extend to the front limbs and then to the head before death. With the complete paralysis of the limbs and head, the only perceptible signs of life are the movements of respiration. Death usually follows quickly. The onset of the general paralysis is usually considered the beginning of the paralytic or dumb stage of rabies.

PARALYTIC OR DUMB STAGE.—Following the change in the disposition, it may be observed that the dog is in search of a secluded and dark place. He is apt to crawl beneath furniture or furnishings of house or barn, and if not disturbed, die there. Paralysis is the predominating symptom in the paralytic or dumb stage, and as a rule first involving the muscles of the pharynx, then the muscles of the face, causing the lower jaw to hang and the mouth to remain open. Drowsiness rapidly overtakes the animal, and it is difficult and often impossible to arouse him. The paralysis rapidly progresses and death usually follows within two or three days. The usual position of the dog at death is curled up as though asleep. The course of the disease after symptoms have developed is rapid, from two to eight days. The symptoms in man, cow, horse, cat, hog, sheep, goat, deer, rabbit and guinea pig may also be described under the stages premonitory, furious and paralytic, varying considerably in the different species.

GROSS APPEARANCE AFTER DEATH.—The morbid anatomy of rabies is limited as there are no gross changes that are constant or specific of the disease. With the natural death of a rabid animal, the general condition of the body is one of emaciation. Wounds healed and recently inflicted may be found. The eyes are usually covered with mucus or foreign material. The mucous membrane of the mouth may be dry, discolored, blue to black. Where an animal is destroyed during the first stage, the mucous membrane may be excessively moist, the saliva mixed with air may be seen as froth hanging from the lips.



Fig. I. Proper length of neck with head intended for laboratory examination. A—Hippocampus Major.
B—Cerebellum.

Fig. II. Showing pneumogastric nerve exposed for removal of nerve ganglion. A—Plexiform Ganglion.
B—Sympathetic Ganglion.

The mucous membrane of the pharynx, oesophagus and stomach may be reddened. In the stomach the presence of foreign bodies may be accepted as an indication of a depraved appetite, which should strengthen the suspicion of rabies. The intestines invariably contain but a scant amount of material. The internal organs are apparently normal, but slight secondary changes may be present, such as bronchitis, developing catarrhal pneumonia or small haemorrhagic foci here and there, etc. The meninges of the brain and spinal cord may or may not be congested. The absence of any gross changes should strengthen the suspicion of rabies.

LABORATORY EXAMINATION.—The importance of an accurate diagnosis made as quickly as possible is well known. In many instances, the history, symptoms and gross appearance at autopsy are not conclusive or as is most frequently the case, they are highly suggestive of the existence of rabies and a laboratory examination must be resorted to. As the laboratory examination is limited to the brain, nerve ganglion and upper portion of the spinal cord, it is sufficient to submit to the laboratory the dog's head and neck (see plates I. and II) cut off close to the shoulders. In shooting an animal through the head, the portion of the brain tissue usually examined is apt to be destroyed and, therefore, it is recommended that an animal be shot through the heart or destroyed with chloroform or strychnine. Of the large animals, horse, cow, hog, etc., the brain may be removed and sent more conveniently and with less expense. Rapid decomposition is prevented when the specimen is wrapped in paper or cloth and packed in a metal can or box surrounded with ice in a shipping box. A metal or wooden bucket containing the specimen wrapped in paper or cloth is considerably used, and serves the purpose well. Glycerin has long been known to have little effect on the virus of rabies and experimental animals may be successfully inoculated with brain tissue immersed in glycerin for months, and as the microscopic examination of the tissue is not much interfered with, in glycerin immersed specimens, the specimens sent to the laboratory in glycerin (water and glycerin equal parts frequently used) are almost as desirable as the fresh specimens.

ANIMAL INOCULATION TEST.—To reproduce rabies with material suspected of containing the virus is absolute proof of its existence in the animal from which the material was taken. It is well known that the saliva carries the infectious material or virus. Proof of this lies in the manner in which the disease is transmitted, under natural conditions, through the bite of an animal with rabies, the saliva being the only material left behind as the bite is inflicted. In the work of Pasteur, in the general study of the disease, he found that of experimental ani-

mals inoculated with saliva containing the virus, a large percentage not only failed to develop the disease, but also that the period of incubation in those that developed symptoms and died was very uncertain. Sound experimental work was therefore impossible until a trustworthy method was found whereby the disease could be reproduced in a high percentage of all the experimental animals inoculated with material containing the virus. Thus, Pasteur was led to use emulsions of spinal cord or brain tissue and it was found that the virus in these structures was least liable to be contaminated, more constant and probably in a more concentrated form. As the seat of injection influences not only the percentage of mortality, but also the length of the period of incubation, cutaneous injections or infection through a wound in the skin, subcutaneous, intraperitoneal, intramuscular and intravenous injections were tried and still the percentage of animals that would not develop rabies was too large and the period of incubation too varied to consider the results uniform. The best results were not obtained until the distance from the point of injection to the spinal cord or brain tissue, particularly the last-named structure, was reduced to a minimum, which was accomplished by injecting material containing the virus directly over the brain or spinal cord, beneath the meninges—subdurally. As a means to demonstrate the presence of the virus, rabbits are generally used. Subdural injections are easily made without any pain to the experimental animal. A 2 per cent. cocaine solution is usually injected subcutaneously over the forehead as a local anaesthetic. An incision is made parallel to the long axis of the head, less than 2 cm. long, a little to one side of the median line, through the skin and periosteum over the frontal bone. The soft tissues are spread apart and a small hole is drilled through the bone or preferably a small trephine is used and a disc of bone is removed about 0.5 cm. in diameter. The point of a syringe needle through which the emulsion containing the virus is forced from a syringe is inserted through the meninges and several drops of the emulsion is injected over the brain. The emulsion is usually made with a piece of brain tissue, diluted with twice

its volume of sterile normal saline solution. Of 117 rabbits so inoculated with brain tissue containing the virus of heads sent to the laboratory during 1905 and 1909 inclusive, 107 (91.3 per cent.) died of rabies on an average of 25.3 days; one in nine days and one in 134 days after the inoculation. These figures do not represent the length of the period of incubation, in that none of the rabbits were kept so as to observe the onset of the first symptoms. The period of incubation is, therefore, shorter by at least 4 days, which would make the period twenty-one days on an average. Several unusually long periods from the time of injection to death were observed among the rabbits included in the 107, of these 66, 85, 110 and 134 days were the longest. Ten (9.7 per cent.) of the 117 rabbits resisted infection. It is the general experience that every now and then a rabbit will resist infection, and for this reason two rabbits are usually inoculated. The mate of each of those that resisted infection died of rabies. For a rabbit to develop rabies 100 days or more after inoculation is exceptional, and it is entirely safe to assume that the virus was not in the suspected material inoculated, or that rabies did not exist if both rabbits are alive at the end of 100 days. In the routine diagnosis of specimens received at the laboratory of the Pennsylvania State Livestock Sanitary Board during 1905 and 1909 inclusive, 313 rabbits were inoculated subdurally; 107 of which developed rabies; 206 failed to give any positive proof of the existence of rabies, of which 129 outlived the 100 days allotted, 53 died of unknown causes, 18 died of septicemia, 3 of cerebral haemorrhage, 2 of coccidiosis and 2 of enteritis.

Wilson, of the New York Board of Health (1898), was the first to use guinea pigs in the place of rabbits, as the period of incubation in these animals is shorter than in rabbits. Of 36 guinea pigs dead of rabies, the average period from the time of injection to death was 15.6 days; shortest period 8 days; longest period 24 days. The actual period of incubation would necessarily be a trifle less. Arms⁵, from a large number of guinea pigs kept under observation, estimates that 1.69 days longer is

required for death to take place following the appearance of the earliest symptoms, which would place the average period of incubation at a trifle less than 14 days for guinea pigs.

MICROSCOPIC EXAMINATION.—The distinct changes in the cellular structure of the cerebral hemispheres, cerebellum, spinal cord and nerve ganglion accompanying the development of rabies were pointed out in the early seventies, but Babes in 1892 was the first to search for these tissue changes in animals dead of rabies to assist in the establishment of a diagnosis. He held

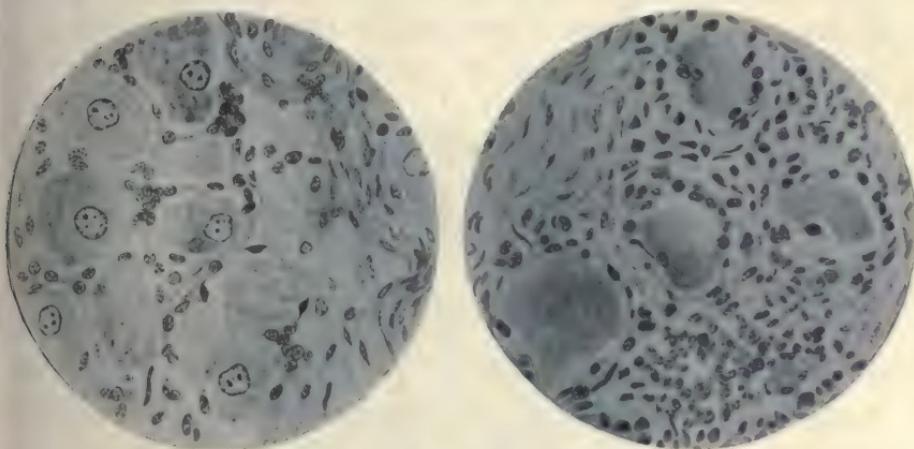


FIG. III.

Section of Plexiform Ganglion of a Normal Dog. Section of Plexiform Ganglion of a Dog with Rabies.

that it was possible to make a rapid diagnosis by a microscopic examination of the medulla oblongata and spinal cord, describing the cellular accumulation in these structures under the name of "rabic tubercle." Following the discovery of the "rabic tubercle" by Babes, Nelis in the laboratory of Van Gehuchten, found changes in the spinal cord and ganglion of two human beings dead of rabies. Ravenel and McCarthy⁶ emphasized the diagnostic importance of these tissue changes in 1900, and expressed themselves of the opinion that the examination of the ganglion in the dog for the changes described by Van Gehuchten and Nelis afforded an accurate means to a rapid diagnosis of rabies. These changes pointed out by Van Gehuchten and Nelis

in the ganglion and those of Babes in the medulla oblongata and spinal cord are the result of the influence of something thrown off by the cause or virus of rabies upon the endothelial cells and nerve cells, directly or indirectly. The endothelial cells forming the walls of the capillaries and the single layer of the endothelial cells which make up the lymph sacs surrounding the larger nerve cells of the spinal cord and those of the nerve ganglion are chiefly involved. These cells are apparently stimulated to proliferate and the increase in the cells causes a thickening of the walls of the capillaries and lymph sacs. Along with these endothelial changes, slightly in advance, the nerve cells undergo degenerative changes—shrinkage, chromatolyses and as the endothelial cells crowd in upon and over the nerve cell, complete destruction of the nerve cell is the result (see Plate III.). Crocq followed by Spiller⁷ was among the first to show that endothelial cell proliferation with nerve cell degeneration and destruction is seen in some conditions, without the existence of rabies. This has been the experience of others and the writer in the study of forage poisoning or cerebro-spinal meningitis of horses has seen typical "rabic tubercles" in the medulla oblongata, and in several dogs with distemper, endothelial cell proliferation changes were found in the ganglion.

In 1905 to 1909 inclusive, sections of the medulla oblongata and ganglion, including one of the sympathetic ganglion and plexiform ganglion of the pneumogastric nerves were examined for proliferation changes with the following results:

	251 Positive Cases.	86 Negative Cases.
Medulla Oblongata 337 (Babes Proliferation Changes)	$\left\{ \begin{array}{l} 180 (71.7\%) + \\ 69 (27.5\%) - \\ 2 (0.8\%) S \end{array} \right.$	$\begin{array}{l} 80 (93.0\%) - \\ 5 (5.8\%) + \\ 1 (1.1\%) S \end{array}$
	171 Positive Cases.	71 Negative Cases.
Sympathetic Ganglion 242 (Van Gehuchten and Nelis Proliferation Changes)	$\left\{ \begin{array}{l} 139 (77.6\%) + \\ 30 (16.0\%) - \\ 2 (5.8\%) S \end{array} \right.$	$\begin{array}{l} 66 (92.9\%) - \\ 3 (4.2\%) + \\ 2 (1.1\%) S \end{array}$
Plexiform Ganglion 468.....	$\left\{ \begin{array}{l} 360 Positive Cases. \\ 357 (99.1\%) + \\ 0 (0\%) - \\ 3 (0.8\%) S \end{array} \right.$	$\left\{ \begin{array}{l} 108 Negative Cases. \\ 71 (65.7\%) - \\ 14 (12.9\%) + \\ 23 (21.2\%) S \end{array} \right.$

* + = Positive; — = Negative; S = Suspicious.

Babes "rubic tubercle" were not seen in 27.5 per cent. of the sections of the medulla oblongata examined from animals with rabies and in 5.8 per cent. "rubic tubercles" were demonstrated in the medulla oblongata of dogs proven to have been free of rabies. The changes of Van Gehuchten and Nelis in the sympathetic ganglion were seen in 77.6 per cent. of the actual cases of rabies, and in 4.2 per cent. of the ganglion of animals free of rabies. The changes in the plexiform ganglion of the positive cases were found in 99.1 per cent., and in not a single instance of all the cases considered rabid did these ganglionic changes fail to show themselves. That similar changes are seen in the plexiform ganglion of animals not rabid is shown in that in

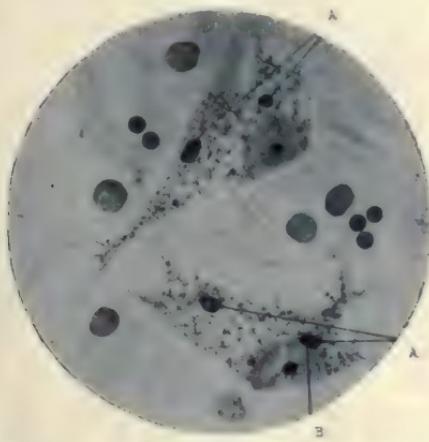


Fig. IV. Two nerve cells of Hippocampus Major (smear preparation) showing Negri Bodies. A—Negri Bodies. B—Inner Bodies with the Negri Bodies.

12.9 per cent. of the negative cases similar changes were found. The changes in the plexiform ganglion are better developed the longer the animal is permitted to live after symptoms of rabies develop.

NEGRI BODIES.—The bodies demonstrated by Prof. Adelchi Negri of Pavia University in 1903 in the nerve cells of the brain and spinal cord of animals dead of rabies and known as Negri bodies, are now held of the highest value in the diagnosis

of rabies, and are looked upon by many as the probable cause of rabies. They have as yet not been demonstrated in any other disease. Bodies such as vacuoles and granules are seen in the nerve cells of the normal animal or in those dead from one cause or another, but these cell inclusions cannot be mistaken for the Negri bodies which have definite morphological characteristics. They are oval or rounded in form and in size vary from exceedingly minute to the largest approaching 25 microns in diameter or length (see Plate IV). Those usually seen in the brain of the dog of the street vary in size from barely visible forms to fifteen microns in diameter, rarely more. The smallest forms are seen in rabbits dead from an injection of "fixed virus," and most extraordinarily large forms are seen in the cow dead of rabies. Negri bodies have distinct staining affinities as they favor the basic stains over the acid. Within the body, small, usually rounded but frequently irregularly shaped inner bodies are seen that favor most all of the chromatin stains, characteristic of nuclear material. With the stains now in general use, these inner bodies take a blue to a black color, the intensity varying with their size. The smaller the inner bodies, the deeper the stain, while the rest of the body takes a light stain, a purple to a pink, or various shades of red. The contrast is at once striking, and these inner bodies encourage attention. The inner bodies may be seen as a single body, which is true of those tiny forms seen in the rabbit, and around these tiny forms, other granular material can be seen. The next larger forms show no appreciable enlargement of the inner body. Usually in the Negri body showing considerable granular material around the inner body, the inner body is apt to be noticeably larger and not stained as deeply as the inner body of the tiny forms. Then, too, in the larger forms, not infrequently several inner bodies are seen lying close to one another, but each small and deeply stained. Forms showing larger inner bodies not so deeply stained are seen, and in addition several smaller deeper stained inner bodies may either lie close to the larger inner body or out in the structure around the inner body. Another form of

much interest is the one in which the inner bodies are scattered through the Negri body, all fairly deeply stained. Not infrequently a form in which these separate inner bodies stain rather deeply scattered through the body, stand out prominently appearing to be pushing out the outline of the Negri body, strongly suggesting pseudopods or budding forms. Of the protozoa, the ameba or rhizapods and sporozoa, exceedingly varied and complicated life cycles are recognized. In one stage of the development of these protozoa, additional chromatin material makes its appearance within the cellular structure, either by a reduction of the chromatin of the nucleus or by the elaboration of chromatin by the cytoplasm, the result of some special stimulus affecting the nucleus or cell protoplasm. The chromatin bodies are distributed through the cytoplasm, and these chromidial forms form a distinct phase in the development of these protozoa. The inner bodies of the Negri bodies, as chromatin or nuclear material, occasionally show an arrangement or stage resembling this chromidial stage of the rhizapods and sporozoa. The position taken by Williams and Lowden⁸ in considering the Negri bodies as protozoa and by Calkins⁹ that they are one of the ameba or rhizapods is well founded, on the study of the various forms of the bodies met with. The protozoon nature of the cause of rabies receives additional support in that quinine will neutralize the virus in test tubes.

That Negri bodies are closely associated with the cause of rabies has been proven by the uniformity with which it is possible to reproduce the disease with material in which the bodies are demonstrated. They have been found in the larger nerve cells of the brain, in the cerebellum, hippocampus major, medulla oblongata and cerebral cortex. They have never been demonstrated in the nerve trunks, but they have been seen in the nerve cells of both the plexiform ganglion and the ganglion closely associated with it—the sympathetic ganglion. Attempts to demonstrate Negri bodies in the saliva or salivary glands or the milk or the mammary glands, lachrymal secretion or lachrymal gland, supra-renal gland and pancreatic secretion or pan-

creas, has never been successful, nor have Negri bodies been found in the blood or any of the tissues of the body excepting those named of the nervous system. It will be extremely difficult to satisfactorily explain, when Negri bodies are accepted as protozoa and the cause of rabies, why it is that these bodies cannot be demonstrated in the saliva or salivary glands or other body secretions or glands which are known to contain the virus, but some light may be thrown upon this puzzling fact when it is remembered that the life cycle of many of the known rhizopods or sporozoa is extremely complicated and spore forms or sporozoits exceedingly small are formed, some of which may be of invisible size. It is therefore reasonable to conclude that similar small sporozoit formation may be a part of the life cycle of the Negri body protozoon, and that it is the small sporozoits in the saliva and other secretions which have as yet not been demonstrated. Negri bodies were first demonstrated in sections of the brain tissue and many different stains are in use. They are readily demonstrated in sections stained with haematoxylin and eosin, but there are other stains which may be used to advantage to bring out the inner structure more clearly. In 1904 it was suggested to Williams¹⁰ that it might be possible to demonstrate Negri bodies in smears of the brain tissue, which was tried and found to be a highly satisfactory and quick method to demonstrate the bodies. The smears are made by spreading over a slide, a small piece of brain tissue in which the Negri bodies are most frequently found. The tissue is placed upon a slide near one end and is covered with a cover slip. Pressure is then applied upon the cover slip and the brain tissue flattened out and spread toward the other end of the slide. The smears before they are given an opportunity to dry are placed in absolute methyl alcohol, one to three minutes, which, in dehydrating the tissue, firmly fixes the smear upon the slide. The methods of staining these smears are numerous and most all of them good, providing they bring out the inner bodies and stain the structure surrounding these inner bodies of a different shade or color, than the nerve cell in which they are found. In the laboratory

of the Pennsylvania State Livestock Sanitary Board, the following procedure in the demonstration of the Negri bodies has been closely adhered to during the past four years: As soon as the animal's head arrives at the laboratory, the entire brain and the plexiform ganglion, with its closely associated sympathetic ganglion are removed (see Plates I. and II.). A portion of the cerebellum is placed in sterile glycerin, in which the brain tissue may be preserved and retain the virus for many weeks. These glycerin immersed specimens are only referred to for the animal inoculation test when the microscopic examination is unsatisfactory. Aside from preventing decomposition, the glycerin will also destroy bacteria and check decomposition of the specimen. From the fresh brain tissue, smears are usually made from the hippocampus major and cerebellum (see Plate II.). A piece 1 mm. thick and several mm. in diameter cut from the fresh surface exposed, after an incision is made through the hippocampus major at right angles to its length, or of the cerebellum in which an incision has been made at right angles to the convulsions, is placed upon a slide near one end. Instead of using a cover slip, another slide is placed over the small piece of tissue and gentle pressure is applied and the opposite ends of the slides are moved toward one another. The smears are then placed in absolute alcohol for two to five minutes, whereupon the alcohol is allowed to evaporate and the smears then stained. The stain as recommended by Van Gieson is used.*

Loeffler's alkalin methylene blue..... 1 part
 Distilled water..... 1 part
 Saturated alcoholic solution of fuchsin added in
 drops until the mixture has a purple tinge, or
 until a metallic scum is seen on the surface.

* Dr. John H. Engel, first assistant in the laboratory, who has been entrusted with the examination of the smears during the past two years finds the following formula of the above mixture a satisfactory stain for the average specimen:

Loeffler's alkalin methylene blue.....	5 c. c.
Distilled water.....	20 c. c.
Saturated alcoholic solution of fuchsin.....	4 drops.

The mixture kept at a low temperature can be used for an unlimited length of time, but is apt to change quickly at room temperature, and for this reason a new batch of stain is usually made each day, or as each specimen is prepared for examination. A smear properly fixed upon a slide is taken up with a pair of forceps and completely covered with stain. The slide is passed through the flame of a Bunsen burner several times until steam arises from the heated stain, which is permitted to remain upon the smear for five to thirty seconds. The smear is then washed in running water, and if the color of the smear is blue where the brain tissue is most thick, and red where the smear is thin, the slide is placed between filter paper and dried. As soon as the slide is dry a search is made for large nerve cells with a low power lens under the microscope. The protoplasm of the nerve cells should be stained a light blue, the nucleus a shade of purple and the nucleolus a dark blue. If the cells are stained too deeply the stain may be weakened by the addition of more distilled water or in heating the staining fluid on a smear for a longer time, the intensity of the staining of the fuchsin will be increased at the expense of the blue of the Loeffler's alkalin methylene blue. When a nerve cell is found properly stained, it is examined with an oil immersion lens. Negri bodies with this staining fluid show the inner bodies a bluish black, and the structures around the inner bodies a maroon red. They are found within the cell, outside of the nucleus of the cytoplasm in the nerve cells of sections, but not infrequently in smear preparations, a few Negri bodies not within the nerve cells are seen which have been forced out of the nerve cell as the smear is made. In searching a smear for Negri bodies, only those bodies within the nerve cells should be considered.

Frothingham["] in 1906 demonstrated his impression preparations which he uses in preference to smears. Impressions of the tissue under examination are made by pressing a slide over a fresh cut surface, usually of the hippocampus major or cerebellum. The section of the tissue, hippocampus major or cerebellum, is flattened out with a slide under pressure. The slide

raised from the tissue will show a film on the slide which was in contact with the tissue, and this film may be fixed and stained as are smears. In the film, the outline of the nerve cells and cellular structure taken up, is little disturbed. In the impressions, the Negri bodies are not so apt to be misplaced or rubbed out of the nerve cell as they are in the smear preparations. The stain for Negri bodies used by Harris¹² has been tried and found to take up more time in its application than the Van Gieson stain, but at the same time the inner structure and the differential stain are well brought out and the stain is recommended in the examination of specimens in which the Negri bodies are very small in size, or in exceedingly small numbers. With good material, Negri bodies may easily be demonstrated by either smears or impressions in several minutes. Fresh material is considered better than decomposed, but in our experience Negri bodies are more easily demonstrated in brain tissue from an animal dead 24 to 48 hours than in tissue examined within a short time after death. The changes that take place in the 24-48 hours after death appear to prepare the tissue so that Negri bodies stand out more clearly, and smears and impressions show clearer nerve cells. Decomposition does not interfere very much in the examination until the outline of the nerve cells is destroyed. Even when nerve cells are no longer seen Negri bodies may be found, but it is not safe to venture a diagnosis on these extracellular bodies alone. Although it is believed that Negri bodies can be demonstrated in from 97 to 99 per cent. of animals afflicted with rabies that have been permitted to die a natural death, the results of the examination of the hippocampus major and cerebellum, by means of smear preparations, as shown in the following figures do not show this to be so:

	393 Positive Cases.	146 Negative Cases.
Hippocampus major 539 (Smears for Negri bodies)	{ 349 (86.3%) + 37 (9.6%) — 7 (1.7%) S	143 (97.9%) — 0 (0.0%) + 3 (2.0%) S
	341 Positive Cases.	145 Negative Cases.
Cerebellum (Smears for Negri bodies)	{ 301 (88.2%) + 33 (9.6%) — 7 (2.0%) S	141 (97.5%) — 0 (0.0%) + 4 (2.7%) S
+ = Positive; — = Negative; S = Suspicious.		

The high percentage, 9.6 per cent., of failures to demonstrate Negri bodies in positive cases is unusual, is perhaps partially explained in that many of the specimens examined were from animals killed early in the onset of symptoms of the disease, and the specimens in all stages of decomposition. Our greatest difficulty in demonstrating Negri bodies in the smears is experienced with the specimens from the larger animals, particularly the horse. The brain of the horse seemingly contains a substance which interferes with the proper staining of the smears and impressions. Then, too, the distribution of the bodies in the brain of the horse is not uniform; they are apt to be localized and this fact also accounts for the high percentage of failures to demonstrate Negri bodies. The same difficulty in the staining of smears or sections and the tendency for the bodies to localize is met with in the hog and deer, to a less extent in man, and only occasionally in cattle.

In 127 instances in which animal inoculation tests were made following the examination of the brain tissue for Negri bodies, in not one of the 61 in which Negri bodies were demonstrated in the material inoculated did the rabbits fail to develop rabies. In 66 in which Negri bodies were not found in the material inoculated, the animal inoculation test was negative in 52; in 14 the animal inoculation tests proved that rabies existed. Negri bodies during 1906 and 1909 inclusive have been sought for in 728 cases and found in 512, and in 216 no Negri bodies were found.

RULES REGULATING THE EXAMINATION AND DIAGNOSIS.— Negri bodies and the Van Gehuchten-Nelis changes make their appearance in the nervous system a short time before the animal shows symptoms. The virus, however, may be present in the saliva and the animal capable of transmitting the disease several days before symptoms are observed. From the routine examination of specimens, it is seen that Negri bodies are most abundant and the Van Gehuchten-Nelis changes most marked in dogs that have died a natural death. In those animals destroyed early in the course of the disease, it is difficult and at times im-

possible to demonstrate Negri bodies or Van Gehuchten-Nelis changes, although rabies exists. Therefore, the rules regulating the examination and diagnosis largely depend upon the manner in which the animal met its death. It is always desirable to have this information with the specimen.

Specimens from animals that have died a natural death, those who destroyed, are examined and the diagnosis is made as follows:

1. Smears are made and examined for Negri bodies, and as soon as the bodies are found the examination is discontinued and a diagnosis of rabies is made. 2. When Negri bodies are not found in the smears, sections of those structures already examined by the smear method are examined, and if Negri bodies are found the examination is discontinued and a diagnosis of rabies is made. 3. When Negri bodies are not demonstrated, the plexiform ganglion are examined for the Van Gehuchten-Nelis changes, and if absent a negative diagnosis is made. 4. Where Negri bodies are not demonstrated and well marked characteristic Van Gehuchten-Nelis changes are found, a diagnosis of rabies is made and the animal inoculation test is carried out to verify the diagnosis. 5. Where Negri bodies are not demonstrated and slight proliferation changes are seen in the plexiform ganglion, it is reported that the microscopic examination is negative, and that the diagnosis must rest upon the result of the animal inoculation test.

Specimens from animals destroyed shortly after the first symptoms are noted and suspected of having rabies, the examination and diagnosis is made as follows:

1. Smears are made and examined for Negri bodies, and as soon as the bodies are found, the examination is discontinued and a diagnosis of rabies is made. 2. When Negri bodies are not found in the smears, sections of those structures are examined by the smear method, and if Negri bodies are found, the examination is discontinued and a diagnosis of rabies is made. 3. In those cases where the brain tissue is entirely destroyed and only the ganglia are obtained, the presence of well marked character-

istic Van Gehuchten-Nelis changes in the plexiform ganglion is considered sufficient to base a diagnosis of rabies upon. 4. Where Negri bodies are not demonstrated and well marked, Van Gehuchten-Nelis changes are found, a diagnosis of rabies is made and the animal inoculation test is carried out to verify the diagnosis. 5. Where Negri bodies are not demonstrated and no proliferation changes are seen in the plexiform ganglion, it is reported that the microscopic examination is negative and that the diagnosis must rest upon the result of the animal inoculation test.

As soon as the result of the animal inoculation test is obtained, it is reported. All experimental animals are kept for a period of 100 days, and if at the end of that time they show no symptoms, the animal inoculation test is considered negative.

In the routine examination of the specimens suspected of rabies in the laboratory of the Pennsylvania State Livestock Sanitary Board during 1905-1906 inclusive, 914 were included, as shown in Table No. II., the animal inoculation test was resorted to in 198 cases, 87 of which proved positive and 111 negative.

TABLE NO. II.

Specimens Examined and Diagnosis 1905-1909, Inclusive.

	1905.	1906.	1907.	1908.	1909.	Total of Species.	Diagnosis.
Dog	{ 67+	76+	73+	90+	189+	495+	78.1%+
	11—	9—	15—	29—	51—	115—	18.1%—
	1S	1S	1S	..	2S	5S	0.8% S
	..	1D	3D	13D	2D	19D	3.0%D
	1+	1+	10+	7+	15+	34+	68.0%+
Cow	{ 1—	..	5—	4—	3—	13—	26.0%—
	2S	..	..	..	..	2S	4.0% S
	..	..	..	..	..	1D	2.0%D
Horse	{ 1+	2+	..	2+	6+	11+	44.0%+
	1—	5—	..	3—	4—	13—	52.0%—
Mule .....	..	..	..	..	1D	..	4.0%D
Cat	{ 2+	1+	..	..	3+	6+	.....
	1—	..	..	..	2—	4—	.....
Sheep .....	{ ..	..	..	..	1+	2+	.....
	..	..	..	..	1—	1—	.....

	1905.	1906.	1907.	1908.	1909.	Total of Species.	Diagnosis.
Hog .....	..	..	..	..	1+	1+	.....
Deer .....	..	..	..	2+	..	2+	.....
Man	1—	1—	..	..	3+	3+	.....
Rabbits	{ 1+ 1—	{ 26+ 7— 1S	{ 12+ 14— 11+	{ 13+ 9— 11+	{ 42+ 23— 1S	{ 94+ 54— 2S	.....
Guinea Pig	{ 72+ 16— 3S	{ 11+ 2— 117+ 24— 2S	{ 11+ 5— 108+ 39— 1S	{ .. 46— 115+ 85— 1S	{ .. 1— 261+ 85— 15D	{ 23+ 8— 673+ 210— 3S	.....
Total	{ .. 17.6% 3.3% S	{ 79.1% + 17.6% — 1.4% S	{ 81.3% + 16.6% — 0.7% S	{ 71.5% + 25.8% — 0.7% S	{ 65.4% + 26.1% —	{ 74.5% + 24.2% — 0.8% S	{ 73.7% + 23.0% — 1.0% S
Percentage ..	.....	.....	0.7%D	2.0%D	8.5%D	0.5%D	2.3%D

+ = Positive; — = Negative; D = Decomposed; S = Suspicious.

Specimens from a fairly large variety of animals have been examined and attention is called to the fact that Negri bodies were demonstrated in each of the species, including three human beings. The rabbits and guinea pigs tabulated are some of the experimental animals in which it was necessary to examine the brain tissue for Negri bodies. The brains of all the rabbits and guinea pigs that died within the usual period of incubation, were examined and the diagnosis was made on the Negri bodies in each instance. 73.9 per cent. of all the specimens examined were found positive, 22.9 per cent. negative, 0.9 per cent. remained suspicious and 2.9 per cent. were too far decomposed for examination. The percentage of positive cases may be somewhat higher than is the experience of other laboratories, which must be attributed to purely local conditions.

In Pennsylvania, the State Livestock Sanitary Board prefers the confirmation by a laboratory examination of all epizootics as they arise in a new locality and not infrequently a rapid succession of positive cases, makes their appearance in the laboratory.

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ILLEGAL VETERINARY PRACTITIONER FINED.—R. J. Johnson, of Big Lake, was fined \$50 before the Municipal Court on account of practicing veterinary medicine in the state without a license. Mr. Johnson pleaded guilty on the charge when arraigned. The prosecution was pushed by Dr. C. A. Mack, Secretary of the State Veterinary Examining Board. Mr. A. J. Tupa, Assistant Secretary to the Board has been doing some active detective work in obtaining cases of illegal veterinary practice. In the criminal complaint made, it was shown that the illegal practitioner, Mr. Johnson, treated a horse for Mr. Tupa for what he called kidney trouble. His lack of knowledge of veterinary practice was brought out by the fact that he diagnosed the case as kidney trouble, when, in fact, the horse was perfectly sound.

FORAGE POISONING OR CRYPTOGAMIC POISONING; ALSO CALLED ENZOOTIC CEREBRITIS, EPI- ZOOTIC CEREBRO-SPINAL MENINGITIS, LEUCO-ENCEPHALITIS, ETC.

By C. H. STANGE, AMES, IOWA.

Numerous cases have been reported of an affection of the central nervous system, the symptoms being in general quite similar but different and varying causes are assigned. Dr. Francis reports that in the fall of 1903 and spring of 1904 four to five thousand horses and mules died with a nervous disorder characterized by structural changes in the brain which caused incoordination, delirium, coma and usually death. He concludes that the disease is not caused by molds, but is the result of animals having free access to a labor diet when kept in idleness. He was unable to find the germ described by Wilson and Brimball.

Professor Harrison of the Ontario Agricultural College reported several cases, and as a result of his investigations he concluded that the disease was due to a coccus isolated from the meningeal fluids. Pearson studied an outbreak in seven horses, five of which died. The outbreak occurred soon after opening a new silo, the ensilage from which was moldy. The symptoms observed were very similar to those observed by Professor Harrison and he emphasized the paralysis of the pharynx and great muscular weakness. He concluded as a result of feeding experiments that the so-called cerebro-spinal meningitis was a forage poisoning. Dr. Dow, of Connecticut, describes two cases which were attributed to watering from a tub containing a moldy slime. Dr. Ferguson, of Texas, describes three cases of forage poisoning due to smutted corn. There was vertigo, coma, low temperature, pulse in later stages rapid and irregular. In 1901

Dr. Hickman investigated an outbreak among horses in North Carolina in which a large number of horses died. In 1906 another outbreak occurred at the same place (Hyde Co.) in which about forty horses and mules died in about three weeks. The cause in these cases seemed to be molds on vegetation. On the whole the country is low and swampy. The pathological changes of epizootic leuco-encephalitis were described by McCallum and Buckley in 1902. Muller, of Germany, reported an outbreak among horses, cattle and sheep due to moldy straw. (*Berliner-Tierärztliche Wochenschrift.*) Drs. McCarrol and McMullen describe an outbreak of cryptogamic poisoning in horses due to feeding moldy beet tops. Dr. Lockhart described several cases in Canada. The prominent symptom seemed to be the inability to swallow.

Two outbreaks have come under our observation during the past year. The first consisted of eleven head of horses, two were being fed for market, the others were fed in the same manner during the night and turned out during the day. The first animal affected was one being fed for market. It ate part of its feed in the morning but in a few hours symptoms of ptyalism appeared, accompanied by depression and paresis of the hind quarters. By noon the animal was down, unable to rise and struggling some, and died that night. The next animal to show symptoms was its mate. The symptoms shown in this case were similar to acute cases of the so-called cerebro-spinal meningitis, coming on with trembling and weakness causing the animal to stagger. The animal became quite violent at times and finally died, living but a few hours longer than the first. The other seven animals showed a more chronic course, accompanied by inability to swallow, slow weak pulse, difficult, noisy respiration, weakness and paralysis, spasms of muscles of head, neck and back, death taking place in from two to six days. The remaining two animals showed a mild type of the disease as slight loss of control, some exophthalmia, loss of appetite and thirst and loss of condition. These animals were placed on potassium iodide and nux vomica and recovered. An early symptom in

all cases coming under our observation is the ptyalism due to inability to swallow. (Dysphagia.) As a result the saliva collects in the mouth and hangs from it in strings. Muscles of different regions of the body are liable to contract. The breathing was rapid and in some cases of the Cheyne-Stokes variety. The temperature in most cases was sub-normal. In some of the more chronic cases and when the animal had been down for some time with considerable struggling, the temperature was somewhat elevated. The pulse was variable, being about normal in some cases and rapid and almost imperceptible in others.

This outbreak was attributed to moldy silage, which was being fed to the horses, but in order to be more certain 150 pounds of silage were shipped to the College. A sample was submitted to Dr. R. E. Buchanan for examination. In addition two horses were fed this silage to further establish the relationship between it and the cause of death of the nine head of horses. The first horse died in two days from an acute form of the disease. The other horse would not eat the silage readily, consequently lived about two days longer. In both cases the symptoms resembled those seen in the original outbreak. Post mortem revealed no changes except a few petechia along the small intestine, a few infarcts in the kidney and slight softening of the brain. This, however, was not very marked, probably due to the fact that they were acute cases. Microscopic examination revealed the presence of mold in the mucosa and submucosa of the small intestine, also mycelial threads growing between and around the renal tubules.

We suspect that a mold was responsible for the death of these animals, and the following work by Dr. Buchanan is of especial interest in this connection.

MONASCUS PURPUREUS IN SILAGE.*

During the year 1909, the writer had frequent occasion to examine the molds which are common in silage not properly pre-

* R. E. Buchanan (with plates 22 and 23, containing 31 figures). Reprinted for *Mycologia*, Vol. II., No. 3, May, 1910.

pared or cared for. Such moldy silage has in several instances caused the death of farm animals, particularly horses; the symptoms of the disease being those of "forage poisoning" or "equine cerebro-spinal meningitis." Numerous cultures have been made and many molds isolated from different silages, among them several species of *Penicillium*, *Aspergillus*, *Mucor*, the mycelium of a hymenomycete (probably a *Coprinus*), and, in one instance, *Monascus*. The last mentioned was practically the only mold found in one sample. Inasmuch as no record has been found of its occurrence in America and no record of its occurrence in silage, a brief account of the fungus is here given with notes on its morphology and cultural characters.

In March, 1909, a moldy sample of silage was brought to the laboratory by a veterinarian. It was part of the contents of a silo and had been the apparent cause of the death of nine horses that had been fed upon it. Experimental evidence was brought forward later by Dean Stange, of the Department of Veterinary Medicine at the Iowa State College, which demonstrated the causal relationship of this silage to the disease. An examination of the material showed it to be thoroughly infected and matted with the mycelium of *Monascus*. Although no experimental evidence of any direct relationship between this particular organism and the death of the horses has been shown, the fungus has been thought worthy of study and record on its own account.

Gross Characters of the Mold.

It is generally known that silage insufficiently packed or too dry when cut is much more apt to mold than that which is moist and well compacted. The material brought to the laboratory was much drier than usual, and matted together by mold into large masses which offered considerable resistance to being torn apart. Examination showed all parts of the silage, leaves, stalks, and ears, to be covered with a white layer of mold, forming cottony masses in some of the spaces. Where it occurred on the kernels of corn, particularly where they had been broken or

crushed and the starchy endosperm exposed, the mold often assumed a pink to carmine-red color.

Isolation and Cultural Characters.

Silage Agar.—Five hundred grammes of fresh silage was boiled for thirty minutes in one liter of tap water. This was then filtered and the silage on the filter washed with hot tap



FIG. 1. Colonies of *Monascus purpureus*
two weeks old in silage agar.

water until a liter of the decoction was secured. This was autoclaved with one and one-half per cent. agar agar threads, filtered, tubed and sterilized. Dilutions were prepared from the silage mold at points where conidia were found most abundant. These conidia germinated within twenty-four hours in most instances. The mold colonies in the lower dilutions did not develop very far on account of the luxuriance of bacterial growth. In the other plates, however, the bacterial colonies were scattered so that they did not interfere with the normal development of the

mold. The inhibition of mold growth in the presence of large numbers of bacteria is a possible explanation of the fact that moist silage decays without becoming moldy through the activity of bacteria, while silage somewhat drier becomes covered with molds. Within the course of a week these mold colonies were from one half to one and a half centimeters in diameter. The outlines of the colonies are very indefinite, for the organism grows almost entirely within the substratum, forming there conidia and perithecia near the center of the colony. However, aerial hyphae are usually produced, forming a cottony surface growth not more than a millimeter in height. Within a few days, the colony, particularly near the center, becomes tinged with red and in two or three weeks is a deep carmine. This coloring gradually extends throughout the colony, always being deepest near the center.

Silage Broth.—A decoction of silage was prepared as outlined in the preceding paragraph, and used without further additions in 50 c. c. lots. The organism grows rather slowly in this medium, forming spherical cottony masses of hyphae not easily broken up by shaking. In one to two weeks the hyphae reached the surface of the medium (a distance of about 2 cm.) and two weeks later the surface growth attained a diameter of from 1-4 cm. This surface growth develops large numbers of aerial hyphae, not extending more than one millimeter above the surface. There is a red pigment produced in some cases, but most cultures remain perfectly white (Fig. 2).

Glycerin Solutions.—Harz (1890) described *Physomyces heterosporus* from the surface of glycerin vats in a soap factory. Here, as well as in the laboratory, it grew on solutions containing as much as 30 per cent. of glycerin. To determine the ability of the organism in question to use glycerin, flasks containing 100 c. c. of 5, 10, 20 and 40 per cent. glycerin in tap water were inoculated with pure cultures of *Monascus*. Growth occurred in the 5 and 10 per cent. solutions, but little or none in the 20 and 40 per cent. solutions. In the 5 per cent. solution small masses of mycelium could be observed within a few days,

floating in the liquid. These continued to enlarge slowly for two months, at the end of which time they formed a semi-transparent mass of a quarter of the volume of the medium. The interior of such masses was found to be densely matted, and of a deep carmine color. In a 10 per cent. solution of glycerin growth was slower, the colonies or mycelial balls remaining smaller and more compacted.

Rice Flour.—A thick paste of rice flour in tap water was prepared and sterilized in test tubes. Growth on this medium



FIG. 2. Colonies of *Monascus purpureus* one month old in silage decoction.

was more luxuriant than on any other tried. Within two days after inoculation, mold patches could be observed, as delicate white colonies arising from the surface of a carmine-red medium. The mycelium completely covered the surface within a few days and the medium changed to an orange-red. The surface of a culture a month old is somewhat wrinkled, the fungus forming a gray felt, with the medium itself entirely red.

Morphology.

The hyphae of the organism vary from 2 to 5 microns in diameter, branching abundantly and rather irregularly. When within the medium or just at its surface, branching is much more abundant than in the aerial hypae. Under certain conditions, as between broken corn kernels, the hyphae may lie tightly packed side by side (*pl. 22, f. 6*) with little or no branching evident. The mycelium does not produce differentiated vegetative hyphae and conidiophores. The conidia may appear terminal on almost any branch. The hyphae are septate, the cell contents usually granular, and the older cells are vacuolate and contain oil drops.

Barker (1903) has noted the frequent occurrence of swellings on the hyphae of *Monascus*, particularly when the concentration of the solution had increased by evaporation, as in an old hanging drop. That this is not the only cause of such swellings is evident from *pl. 22, f. 1*, which shows their presence on aerial hyphae. They were also found abundantly in the 5 and 10 per cent. glycerin cultures. In size and shape these swellings approach the conidia. On starchy media, and in some others, the red coloring matter is to be found irregularly distributed through the older threads.

Conidia.—The conidia are borne singly or produced in basipetal chains of 2-6 or more. They may be found on aerial hypae or imbedded in agar or immersed in a nutrient solution. They may even be abstracted by the tips of the filaments which invest the perithecium. No evidence of the formation of micro- and macro-conidia could be discovered, although considerable variation in size was noted, from 6 to 10 by 7 to 15 microns. The conidia are sometimes tinged with red in old cultures; usually, however, they are colorless (*pl. 22, f. 2, 3*). Germination occurs under suitable conditions within a few hours (*pl. 22, f. 5*).

Ascocarp or "Perithecium."—The fruiting body of *Monascus* (or *Physomyces*) was first described by Harz (1890) as a sporangium or sporocarp. More recent writers, as Barker (1903) and Olive (1905), have shown it to be of an ascomycet-

ous type, although this claim has been denied by Ikeno (1903). All are agreed, however, that it is produced as the result of a true sexual fusion. Observations of the form in question seem to indicate that the interpretation given by Olive (1905) is the correct one. Serial sections have not been prepared, however, and the exact sequence of events cannot be accurately determined without a careful study of the subject. The perithecia develop in great numbers upon the hyphae and are generally terminal, though sometimes apparently lateral (*pl. 23, f. 8*). The young perithecia may be found in suitable media within two or three days after sowing the conidia. They develop not only an aerial hyphae, but also in the body of a medium such as agar, and nowhere were they found more abundant than in 5 and 10 per cent. glycerin solutions. So marked is this ability to produce perithecia and conidia under water, that the organism might well be classed as one of the aquatic molds. An antheridial cell fuses with a functioning egg cell, and, within this, are developed the ascogenous hyphae which ultimately form one to many asci, each typically with eight ascospores. The steps in this process can be seen only with difficulty, for the "central cell" soon becomes closely invested by sterile hyphae which branch and apparently anastomose about it.

Various steps in the development of these hyphae may be seen in the figures (*pl. 23, f. 4-10*). Sometimes branches may extend out from this investing mass (*pl. 23, f. 10*) and even produce conidia. These hyphae soon lose their contents and collapse, forming a thin membrane at maturity, which sometimes shows little evidence of its origin. *Pl. 23, f. 11* shows a perithecium nearly mature, with the ascospores grouped within the asci. The walls of the latter soon disintegrate and the ripe perithecium filled with loose spores resembles the sporangium of a phycomycete. These perithecia vary from 25 to 50 microns in diameter. They are usually terminal at the end of a long hypha, but in some media there may be noted variations in the length of this pedicle. The spores within the perithecium number from 6 or 8 to several hundred. They are nearly spherical in shape and from

3.5 to 6 microns in diameter. They are usually tinged with brown or are slightly fuscous when mature.

Specific Position of Silage Monascus.

There have been described in literature five species of *Monascus*. *M. heterosporus* Schröter (*Physomyces heterosporus* Harz) differs from the form in question in having two types of conidia, having smaller conidia, and developing in much more concentrated solutions of glycerin. *M. ruber* van Tieghem differs in having larger conidia and spores and a red peritheciun. *M. mucoroides* van Tieghem has larger perithecia, spores and conidia. *M. purpureus* Went agrees in all essential characters, and this organism is placed here tentatively. *M. purpureus* is the characteristic mold used by the peoples of eastern Asia in the preparation of "red rice" (Ang-quac). The fact that rice covered with this mold is used by the Chinese as food rather militates against the possibility of the form in silage being poisonous. This has not, as before stated, been investigated as yet, and further study may cause a change of view as to its specific position.

Summary.

A mold answering to the description of *M. purpureus* Went was found to be the typical fungus present in a moldy silage which killed eleven horses. The pathogenic properties of the organism have not as yet been wholly determined. This appears to be the first record of the occurrence of *Monascus* in this country.

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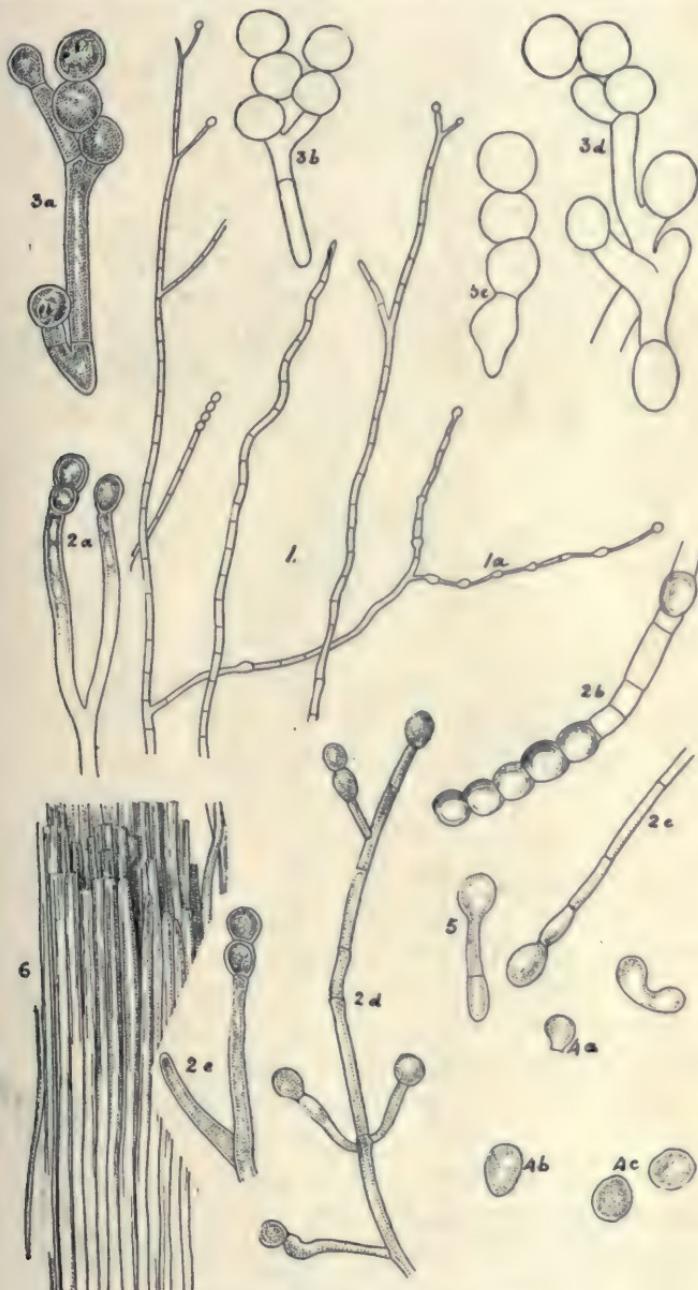
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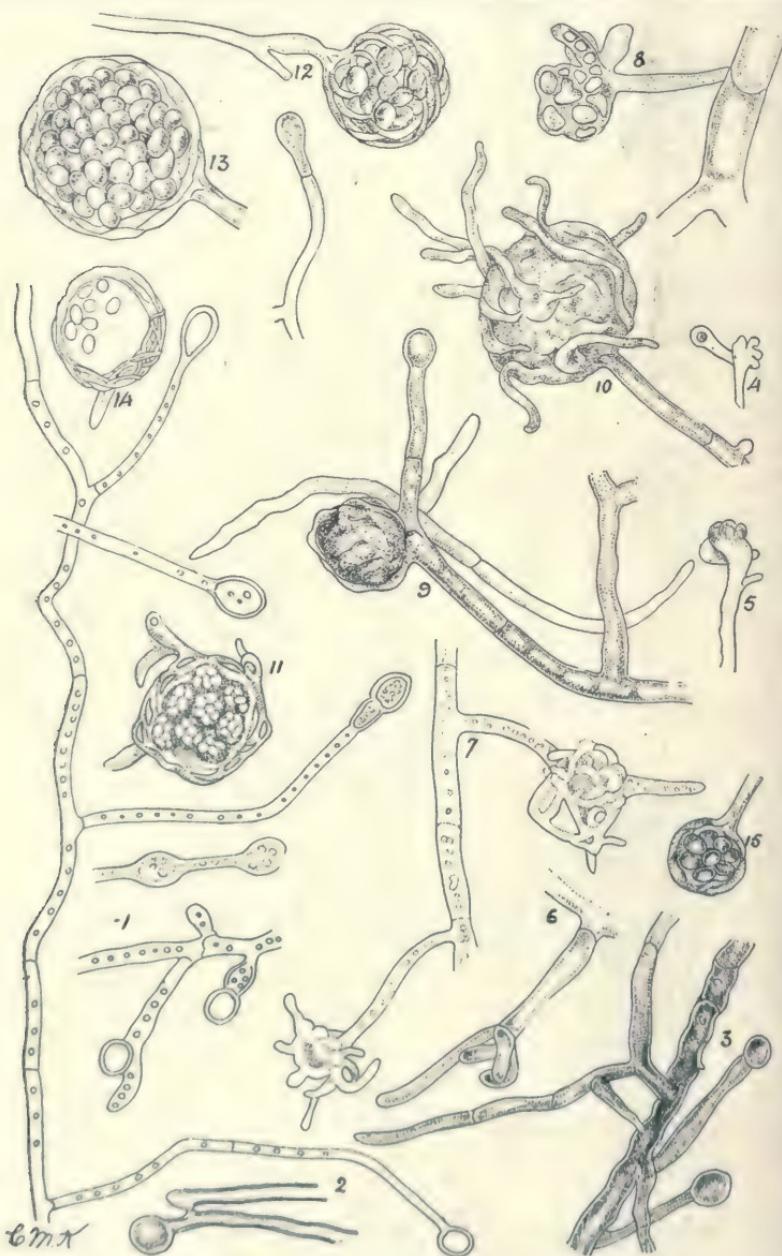
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IOWA STATE COLLEGE, AMES, IOWA.

*MONASCUS PURPUREUS WENT.*

1. Aerial hyphae with conidia and with swellings at 1a on a branch.
- 2a, 2b, 2c. Conidiophores with conidia.
- 3a, 3b, 3c, 3d. Conidiophores with conidia.
- 4a, 4b, 4c. Conidia.
5. Conidium germinating.
6. Mass of parallel hyphae from surface of moldy corn kernel.



MONASCUS PURPUREUS WENT.

- 1, 2. Hyphae with oil drops and conidia from glycerin solution.
3. Hyphae and conidia from silage decoction.
- 4, 5, 6. Very early stages in formation of perithecium.
- 7, 8, 9. Sterile hyphae branching and anastomosing about "central cell."
10. Sterile hyphal covering of perithecium sending out branches. These are sometimes tipped with conidia.
11. Optical section of nearly mature perithecium. Spores still within ascii.
- 12, 13, 14, 15. Optical sections of mature and nearly mature perithecia, showing variations in size.

The other outbreak consisted of four horses, three of which died of an acute form of the disease, the symptoms being similar to those already described. The fourth being of a more chronic nature was placed on potassium iodide and nux vomica and recovered. In this outbreak the hay was found to contain a fine mold and was cut from an old pond which had been plowed up and seeded. The water had overflowed this, however, and stood for some time. The symptoms and post mortems were similar to those described in the first outbreak, with the exception that no histological examinations were made.

A form of cerebro-spinal meningitis is quite common in Germany. It has also been described in Australia, Great Britain and Russia. It may be that these outbreaks are due to other causes than those already described. Sidamgrotzky and Schlegel found a form of coccus in the subarachnoid fluid, but it was necessary to make subdural injections of cultures of this organism to cause meningo encephalitis. Johne found a diplococcus in the cerebro-spinal fluid of affected horses.

Ostertag found a diplococcus similar to the one found by Johne in the cerebro-spinal fluid in the so-called Borna's disease. They were pathogenic for horses and subdural injections produced symptoms and death similar to cases of Borna's disease. Hutyra and Marek call attention to the fact that bacteriological investigations have not been followed by the same result, but possibly the several investigators were working with the same organism. Nevertheless it remains to be shown whether all cases of cerebro-spinal meningitis are due to the same cause and resembles Borna's disease. On the other hand it is possible that epizootic cerebro-spinal meningitis of domestic animals has no specific cause.

It is apparent that moldy food and water has caused several outbreaks in this country. Natural infection in European outbreaks is also supposed to take place through infected food and drinking water. The disease is not transmitted from one animal to another. Mohler calls attention to the very interesting work of Schlegel in the *Berliner Tierärztliche Wochenschrift*, who as-

sociates with the affection an organism which he termed streptococcus melanogens. Mohler states, however, that whether the disease is of microbian origin or an intoxication has not yet been definitely established.*

CHRONIC BACTERIAL ENTERITIS.

Sometimes called chronic bacterial dysentery or chronic pseudo-tuberculous enteritis is a chronic affection of the intestinal tract of cattle.

This disease was first discovered by Johne and Frothingham in 1895. They observed a case of infiltrative, non-ulcerative form of enteritis which they regarded as due to infection with avian tubercle bacillus. It was again described by Markus in 1904. In 1905 Lienaux and van den Eckhart described the same condition. Borgeand reported a few cases during the same year. Mathis observed the disease in 1906. Bougert found the disease among cattle in the slaughter houses in Berlin. Bang gave a careful description of the disease in *Berliner Tierärztliche Wochenschrift* (1906). McFadyean reported several cases and gave a careful description of the disease in the *Journal of Comparative Pathology and Therapeutics* (1907).

According to Markus the disease is quite prevalent in Holland. In the United States it was first recognized by Pearson in Pennsylvania, later by Beebe in Minnesota and by Mohler in some Virginia cattle. It was my privilege to investigate several cases during the fall and winter of 1908.

In September, 1908, a short horn bull about nine months old with a chronic diarrhoea was brought to the clinic. The owner informed us that he had lost another calf a short time previous from what seemed to be the same disease. Treatment was to no avail. The disease developed gradually, the symptoms in the beginning being scarcely recognizable. The looseness of the bowels developed into a diarrhoea, the feces being watery, not

* As the foregoing article by Dr. Stange also forms a portion of his report as Chairman of the Committee on Diseases and Their Treatment (Ia. Vet. Assn.), we have made it a part of said report; the remainder of which follows.

especially offensive and there was no tenesmus. The appetite varied, but was usually quite good and not completely lost until the disease had nearly run its course. At the same time the emaciation became more marked. While the animal was quite weak there was no marked depression such as would be expected in such grave disturbances of nutrition. The temperature remained about normal until just before death, when there was a slight rise. The pulse was near normal. The coat was rough and staring. Post mortem revealed great emaciation, otherwise no noticeable changes in any of the organs except the small intestines, the mesenteric glands and the gall bladder. The walls of the small intestines were somewhat thickened and the mesenteric glands appeared slightly enlarged and watery. The gall bladder contained about a quart of bile, which on standing separated into two distinct layers, an upper clear layer and a sediment of a rusty brown color. No definite diagnosis was made at this time.

A few weeks later the owner's farm was visited. Three animals were found affected at that time—one heifer about seven months seemed to be in the last stages of the disease and was killed. Post-mortem examination revealed great emaciation, thickening of the walls of the small intestines, some portions being more afflicted than others. A few small nodules were found. Portions of the intestines, mesenteric glands, kidneys, liver, heart and lungs were taken to the laboratory.

Microscopic examination revealed necrosis of the superficial portion of the villi as indicated by staining properties.

The mucous coat was thickened. The epithelioid cells described by Bang were found, but not in such great numbers as his description would indicate. No affection of gall bladder.

Sections of the mesenteric glands when stained for the acid fast bacillus revealed the presence of the bacillus.

The disease is undoubtedly more prevalent than is generally supposed. It has been reported in Germany, France, Belgium, Holland, Denmark, England and probably in the Jersey Islands. Mohler writes that "at the ninth International Veterinary Con-

gress at the Hague, Drs. H. Markus, J. Bougert, and Meissner read papers on this subject, and while these investigators could not find any identity or relation between the organism of this affection and that of tuberculosis, they were unable to obtain any good results from the various methods of treatment which were tried in the course of their experiments. The usual astringent and antiseptic treatment failed to effect a cure or even an improvement in the affected animals. The same results followed a change in the food and water. Meissner expects to obtain better results with a serum of artificially infected animals and such experiments are now being carried out by him."

According to some infection occurs in the stables and not in the pastures, but undoubtedly it may take place in both places as was observed in the outbreak investigated by me. In all, six animals were lost. (All of the animals under eighteen months old.) It existed on the place for about two years, and one pasture was infected by turning a sick calf with the healthy ones running in it.

The bacilli are passed with the feces in enormous numbers, consequently isolation should be the first step; next thorough disinfection of the stables. In my experience all the young cattle were removed to another farm and the stables disinfected. Cattle over three or four years of age are not very susceptible.

THROUGH the courtesy of one of our Canadian colleagues we received the following clipping from one of the Canadian dailies:

VETERINARY CORPS AUTHORIZED.

The organization of the Canadian Army Veterinary Service is authorized. There will be three branches, the Permanent, Army Veterinary Corps, Veterinary Corps for Active Militia, and the Regimental Veterinary Corps. The officers of the active militia branch will be qualified veterinary surgeons, who will enter as lieutenants and be promoted according to service. Within two years after their appointment they must pass qualifying examinations. The farriers, shoeing smiths will be included in this branch of the service.

HOG-CHOLERA.

By L. VAN ES, AGRICULTURAL COLLEGE, N. D.

Since the discovery of a practical method of producing immunity against hog-cholera by Dorset and his co-workers, a new interest has become attached to this disease, and it is on account of this new interest that a discussion of its features perhaps is justifiable.

In order to condense our subject as much as possible within practical bounds, we will not make mention of the history of the disease and of the various phases of the evolution of the knowledge now on hand. We will also avoid discussion of the many points of purely scientific interest for the same reason.

There is perhaps no disease which has caused our farmers more palpable losses than this, while our scientists have for years exerted their best efforts in attempts to find a rational method of prevention.

The earlier attempts of this nature were naturally all based upon the belief that Salmon's hog-cholera bacillus was the only specific cause of the disease, and while, no doubt, various investigators succeeded in rendering animals immune against this organism, it was apparent that a great deal of research work was still to be done before the solution of the problem could be looked for. The later work was begun by de Schweinitz, who had commenced to doubt the relation of the hog-cholera bacillus, and when, after the death of de Schweinitz, his ideas were tested and further worked out by his successor Dorset and his fellow workers, the fact was established that hog-cholera is apparently due to an ultra-microscopic or filterable virus, and that if the *Bacillus suipestifer* plays a part at all in the etiology of the disease, it certainly is not a sole or primary one.

This discovery not only opened the way for the subsequent immunity experiments, but it also put a new phase on the disease

known as swine-plague. This disease, most commonly associated with hog-cholera, is regarded as due to infection by *Bacillus suisepicus*, but it is more than probable that this organism also plays a secondary role.

In the outbreak among the swine of this institution, some of our cases showed lesions typical of swine-plague, others those of hog-cholera, while not a few of both diseases. Both diseases, if such they be, were absolutely checked by the use of hog-cholera hyper-immune serum. I will not deny the pathogenic character of *Bacillus suisepifer* and *suisepicus*; in fact, I believe that they define largely the patho-anatomic features of the disease, but it is my opinion that, for practical purposes, we may safely cease to make a distinction between the two types of diseases. As to the nature of and the part played by the so-called filterable virus, we do not know whether we have to deal with a true "contagium fluidum" or with an agent capable of either rendering the body specially vulnerable to infection or of rendering certain micro-organisms specially aggressive. Defibrinated hog-cholera blood when injected into a susceptible animal will promptly produce acute cholera, but it is probable that the natural infection takes place by way of the alimentary tract. In such cases the virus is transmitted by the excretions of diseased animals and contaminated food and water. As to the distribution of the disease from place to place, there are a number of well-known factors which play a prominent part such as the congregation of swine from a great number of localities at stock shows, sales, etc. There are many instances in which such shows and sales have proven to be real clearing houses of infection. A prominent part is also played by intermediary bearers, such as hog buyers, who travel far and wide from hog lot to hog lot; neighbors who, in a spirit of sympathy, visit the premises of friends whose hogs are dying with some fatal disease and who carry infection on their shoes into their own hog lots. It is probable that animals such as birds, dogs, or coyotes also are capable of carrying infection to considerable distance. The dust blown from infected lots also seems a very efficient distributor of infection. Food and drinking

water may be contaminated and thus serve as agents of dissemination. It is a well-known fact that hog-cholera has been carried from place to place by means of small streams.

The course of infection, when once introduced into a herd, varies, no doubt, with the virulence of the virus or with its quantity. In some herds the hogs sicken in rather rapid succession; in others the evolution of the disease is slow. In most instances the progress of the infection is not very rapid, and such explosive outbreaks like we may see in anthrax, for example, are practically unknown in hog-cholera; yet in the individual animals the duration of actual disease may be exceedingly short. The period of incubation also varies; after the hypodermic injection of small quantities of cholera blood the first symptoms of sickness usually occur in from 6 to 12 days, but after natural exposure a much longer period often lapses. In some of our local outbreaks the disease made its appearance about one month after exposure.

The symptoms of cholera do not usually present a pathognomonic character. In the beginning of outbreaks per-acute cases are seen. In those, definite symptoms frequently fail and the affected animal may be found dead without having shown any previous indisposition.

In the acute form, which furnishes the greater percentage of our cases, lack of appetite and a disposition to separation from the rest of the herd is an early feature. The affected hog will bury itself in the litter and is not easily induced to stir about. In white hogs we often find a darkening of the skin, sometimes to redness, and the bristles have a roughened appearance. There is redness, and often injection of the visible mucosæ, while the body temperature is elevated.

Gastro-intestinal phenomena are an early feature of such cases. Vomiting is not uncommon and diarrhoea is frequently seen, although it may be preceded by a constipation of variable duration. Diarrhoea and constipation not rarely are of alternate occurrence. The faeces in diarrhoea are liquid of a light or dark yellow color, and emit a foetid odor. In constipation the faeces are hard, the color is dark or black and often show a covering

of inspissated mucus, which in itself may be tinged with blood. Respiratory difficulty is common. It varies from the symptoms expressive of catarrhal inflammation of the air passages to those of a high degree of dispnœa, occasioned by pulmonary solidification and cardiac weakness. The conjunctivæ are swollen and the eyelids may be stuck together by a purulent exudate. The skin in many cases shows an exanthema. On the abdomen, in the axillary, post-auricular, submaxillary perineal regions and on the inner side of the thighs a diffuse or circumscribed redness may be present, which later on may assume a purple tint. The skin so affected often shows blebs, which later on may dry up to black circumscribed scabs. In the chronic forms of cholera, the more prominent features are emaciation, digestive disturbances like an alternating diarrhoea, and constipation. There are commonly respiratory difficulties, as chronic pneumonia is a frequent complication. Such cases frequently show a fair appetite and not rarely lead one to believe that recovery will take place. In the great majority of cases, however, the lesions present are sufficient to cause death. Since the elimination of the *Bacillus suipestifer*, the diagnosis of hog-cholera can no longer be rendered certain by bacteriologic tests, and we now have principally to depend on the patho-anatomic features to determine the identity of the disease. For this reason we undertake to sum them up in some detail, while in doing so we wish it understood that no attempt will be made in differentiating between the cholera and plague forms of the disease.

In a great number of cholera cases the skin presents lesions of an inflammatory nature. There may be seen a diffuse or circumscribed redness of the submaxillary and post-auricular regions. The same may be seen on the lower surface of the body and is frequently most pronounced in the region of axilla, pubis and the inner side of the thighs as well as the perineum. In some cases the skin lesions consist of decided hemorrhages, dark red in color, now occurring as small punctiform hemorrhages, then again as larger blotches. Pruritus is not uncommon.

As impetiginous exanthema is frequently seen: in such cases vesicles of varying sizes form, which are filled with a serous or sero-purulent fluid. After evacuation or absorption of the contents, the vesicles dry up and become changed to a dark or black incrustation.

In other cases the skin lesions are in the nature of an urticaria, while during the recent outbreak the skin in one case markedly resembled the eruption seen in varicella.

Aside from the lesions mentioned, we frequently meet with passive changes in the skin. These can be attributed to respiratory and circulatory difficulties and are most commonly seen about the ears and amount to a passive congestion, whereby the skin becomes dark in color and more or less edematous. The lymphnodes are the organs which as a rule present the most constant lesions, and it is in those structures that the septicemic character of the disease is most evident. In the beginning of outbreaks, when death from the per-acute form of the disease is commonly seen, the lymphnodes are often the only organs showing a definite lesion, and in making the post-mortem diagnosis in cases of sudden death, they must never be overlooked. In our autopsies during the recent outbreak we never failed to find those changes in the inguinal nodes, while, in fact, they can be looked for in the other groups as well, although perhaps with less constancy. One of the most common lesions is hyperplasia; the nodules are enlarged, grayish-white in color, while their blood vessels are decidedly congested. They are frequently edematous and after a sufficient duration of the disease are apt to show necrotic foci. In the per-acute cases, the lymphnodes more frequently present the picture of a hemorrhagic lymphadenitis. The nodes are greatly swollen and are of a very dark color, which may even be noticed through the fascia surrounding them. In the chronic forms of cholera, the lymphnodes are often found to be very firm on account of the proliferation of the connective tissue elements. In such organs, secondary changes such as hemorrhages, softening, etc., may be met with. The mucosae of the mouth and pharynx are sometimes the seat of diphtheritic

lesions, which may become changed to deeper ulcerations, according to the nature of the secondary infection, which may be playing a part. A croupous-diphtheritic tonsilitis is very common and when found should always arouse the suspicion of cholera.

In the more acute cases the mucosa of the stomach frequently shows a marked hemorrhagic inflammation, which in more advanced cases may become complicated with diphtheritic lesions.

The intestines are the seat of the most classic lesions of the disease, although the most typical ones are not always a constant feature. In a small portion of the cases there is a catarrh throughout the entire tract, in which no erosions of the surface can be shown. The mucous membrane as well as the adenoid structures are swollen. This condition is not uncommon in the per-acute form of the disease.

In quite a number of the per-acute cases a hemorrhagic enteritis is present without showing any diphtheritic lesions. In such cases the entire tract may be involved, although most commonly the lesions are most marked in the large intestines.

The lesions vary much in intensity; there may be diffuse redness, especially of the mucosa, but often also involving the other tunics. Aside of this redness, hemorrhages in the mucosa, submucosa and under the serous coat are common. They vary in size, from the mere punctiform specks to large blotches of the size of a half a dollar. They also vary much in color, ranging from a bright red to a deep black, while in many instances I have seen a rusty color.

In the severe per-acute cases the entire intestinal wall is hemorrhagically infiltrated, the wall itself being thickened and tingescent. In such cases the intestinal contents frequently have a liberal admixture of blood. Accompanying such lesions we find similar ones in the mesentery and meso-colon, while the corresponding lymphnodes are also hemorrhagically infiltrated.

The follicles of the intestinal mucosa may be the seat of inflammatory changes, giving rise to the anatomic picture of an enteritis follicularis.¹ In such a condition the follicles are

1. Poole, *Varkenwickten En Nederland*.

markedly swollen and are conspicuous as white round nodules. Their contents is softened and can be readily squeezed out. The intestinal lymphoid tissue is always hyperplastic. Ulceration of the involved follicles may lead to perforation. The best known lesions of cholera are the intestinal ulcerations. Even here many variations are seen. In one form we see a general confluent, croupous-diphtheritic enteritis in which the mucosa is covered with a grayish-white croupous exudate. When this condition has existed for some days the intestinal wall becomes thickened and rigid and the mucosa becomes necrotic and assumes a dark or black color. In other cases the ulcerations are isolated and vary from superficial erosions with a diphtheritic covering to deep excavations into the thickened intestinal wall. In some of such cases actual perforation takes place, causing sudden death by shock and peritonitis on account of the escape of the contents. In other cases again there is an incomplete perforation just sufficient for the escape of small amounts of intestinal contents. Such accidents are frequently followed by a plastic peritonitis marked by extensive and firm adhesions, binding the intestinal mass into great conglomerations, which often can be found through the abdominal parieties of the living animal.

In quite a few of the cases we meet with and especially in the sub-acute and chronic ones, there may be evidence that the ulcerations are being repaired. In such cases a sharp line of demarcation differentiates the necrotic parts from the normal intestinal tissue. The croupous covering of ulcers becomes drier, shrinks up and assumes a dark or black color, while at the same time it is being pushed into the lumen of the gut by the proliferation of the normal tissues at the base of the ulcer. The characteristic button thus formed may become pedunculated and drop off, leaving a light-colored cicatrix. In acutely fatal cases of cholera, buttons are not often seen, as they are more essential to the chronic cases.

The spleen does not offer anything characteristic. There may be hemorrhages and petechiae under the capsule, while in many cases nothing abnormal can be seen in this organ. In a number

of cases the organ is considerably enlarged and of a black color. In old chronic cases we may find necrotic foci in the spleen pulp.

The liver often shows a marked hyperæmia in the acute cases and shows a parenchymatous degeneration in nearly all cases. In some of the more chronic forms of the disease this degeneration may be very complete, so as to justify the term "fatty liver." In such cases the organ is of a light yellow color.

The peritoneum often participates in the disease. The lesions range from small hemorrhages to a real fibrinous or plastic peritonitis. In the latter cases the lesions are probably due to infection permitted to enter through lesions of the intestinal wall.

The kidneys show degenerative phenomena in all cases, and in quite a few the kidney lesions remain confined to a more or less developed degeneration of the parenchyma. In the greater number of cases we find also evidence of hemorrhagic nephritis in the shape of a varying number of small punctiform hemorrhages in the kidney substance and under its capsule. In one instance I found a very marked hemorrhagic infiltration of the entire urinary tract, with an active subcapsular hemorrhage of one of the kidneys.

The upper air passages are frequently the seat of catarrhal conditions, while the lungs may present a variety of lesions, the majority of which probably being of a secondary nature.

Pulmonary congestion is very frequently found as well as edema, while pneumonia is exceedingly common and is perhaps one of the most fatal complications in the chronic cases.

The inflammatory process may be lobar or lobular. In the former, usually confined to the anterior lobes, the line of demarcation between normal and inflamed lung is sometimes very sharp. The inflamed areas are usually of a light red, brownish or gray color.

In the lobular form, inflamed lobules may be found scattered through the entire lung and may be completely surrounded by intact lung tissue.

In cases of some time standing necrotic changes are common, when necrotic foci spring up in the inflamed areas. The con-

tents of these foci is cheesy or softened, while in some cases they are very similar to real abscesses. It is very probable that the patho-anatomic picture of cholera is largely determined by the organisms which produce the secondary infection.

The pleura is frequently involved. This membrane, especially its visceral portion, is often the seat of petechiae, while intense adhesive pleurites are by no means uncommon.

The heart in the chronic cases commonly has a parboiled appearance owing to fatty degeneration of the myocardium, while in the acute ones we frequently find hemorrhages of varying size under the epicardium.

The pericardium often shows hemorrhages, while adhesive pericarditis is by no means uncommon.

That hog-cholera is not a disease which offers a field for curative intervention is a fact so well known that it will not be necessary to devote much space to the discussion of either treatment or prognosis. The mortality of the disease, in spite of the fact that for years the market has been glutted with cholera remedies, still continues to range between 80 and 100 per cent. Let us therefore turn to the more hopeful field of prophylaxis.

Even this field, up to a year or so ago, offered but a very gloomy aspect. It is certain that the practice of isolation, segregation, disinfection, sanitation, etc., always had an inhibitive influence upon the spread of the disease, but their influence was not so that they could be relied upon as an absolute protection. For a long time it was apparent that, if hog-cholera was to be eliminated, it would have to be done by means of some process of immunization, and for many years science has occupied itself with this problem. It was not, however, until the discovery of the fact that the hog-cholera bacillus is not the primary cause of the disease that the way was opened to a practical solution of the immunization problem, because now experiments could be made in which the *Bacillus suipestifer* played no part. As the result of the research made by Dorset, McBryde and Miles, it was found that hogs which had recovered from an attack of the disease possessed a very potent immunity, but that their blood

could not be absolutely relied upon to confer immunity to other swine injected with it. When the immune hogs, however, were previously treated with large amounts of virulent blood, which they tolerate very well, their blood acquires a marked antitoxic property and confers a passive immunity to susceptible hogs injected with it.

The hyper-immune serum forms the base of the Dorset method of immunizing against hog-cholera.

The method consists of rendering the animals passively immune, and if an active immunity is desired to inject them with a small quantity of virulent blood simultaneously or to expose them to natural infection while their immunity lasts.

The immunity obtained after a serum injection only lasts about four weeks, but if this immunity is rendered active, the animal will be protected for six months, probably much longer.

The serum is injected in doses ranging from 20 to 60 c. c., according to the size of the animal. The injection is made subcutaneously on the inner side of the thigh. If virus is used it is injected in doses of 2 c. c. simultaneously in the thigh of the opposite side.

In some cases the immediate result is a small circumscribed swelling at the point of injection, and it is possible that this swelling is due to a local infection by the needle. It may also be due to the small amount of carbolic acid, which has to be added to the serum in order to insure its keeping qualities.

The efficiency of this serum has been demonstrated in many instances, notwithstanding that failures have also to be recorded, and the question now presents itself as to the manner in which the Dorset method of immunization can be applied in order to secure the eradication of hog-cholera.

It seems certain that the use of the method can be depended on to eliminate hog-cholera as a source of serious loss to our swine breeders, but if this has to be accomplished, systematic action is necessary. The manufacture of the serum and virus should be under the control of the state live stock sanitary authorities. Those products should be placed at the disposal of swine

owners free of charge or at cost, while their use, especially that of the virus, should be left to trained veterinarians operating under the direction of the state authorities. The promiscuous use of the method by everybody will not have a general good result, while the sale of virus by manufacturing concerns should be prohibited, as it is not safe to place virulent material at the disposal of the general public.

It seems best to entrust the manufacturing of the serum to the state experiment stations and to make it the duty of the state live stock sanitary authorities to superintend its systematic application.

All cases of apparent infectious swine diseases should be promptly reported and by methods of publicity swine raisers should be educated to that effect. Such reports should at once be acted upon by a thorough investigation, and when the death turns out to be due to cholera, immunization should at once be undertaken.

In the immunization of herds in which disease has occurred, it is probably better to use the simultaneous virus injection than to depend upon natural exposure. From the experience of the writer it seems, at least, that there are cases in which the infective material gains entrance to the exposed hogs so slowly, or in which the infectious material introduced is so slight, that either the passive immunity has already been used up before the introduction of infection or that the amount of natural virus was too slight to produce an active immunity. The results in both cases are that a permanent immunity is not obtained and that in course of time the animals sicken anyhow. The character of special strains of virus no doubt also plays a part.

We therefore deem it best to immunize by simultaneous injection, so that we make certain of actual exposure.

The injections should be confined to healthy hogs only. The serum has no curative properties and the injection of sick hogs would only mean a waste of material. Furthermore, it would be a cause to permit sick hogs to continue their existence for a while longer, which again would mean an additional amount of

infective material to be scattered far and wide. It is our opinion that after the immunizing of healthy hogs, all sick ones should be immediately destroyed and burned and should, in spite of immunization, some hogs develop cholera, they should be disposed of in a similar manner.

This measure is not designed for the protection of the herd immunized, but simply to prevent infectious material from scattering over a community.

In case immunization is done, immediately after the occurrence of the disease, it may be sufficient to confine action to this one herd unless other swine herds are close by, when it would be better to immunize all hogs within a radius of half a mile.

When the infection has already made considerable headway in one or more herds, it seems advisable to include in the immunizing process all hogs within a radius of three or four miles in order to surround the original focus of infection with a zone of immune animals.

We also consider it of advantage to have the veterinarian who makes the injection prepare the virus to be used with the serum, whenever such is possible. The reason for preferring this procedure lies in the fact that in our experience we encountered some difficulty in preventing putrid changes in stored virus, no matter how carefully prepared and stored. Putrefaction does not seem to destroy the virulence of the blood, nor have we complaints about the virus issued, but on general principles we should prefer the fresh virus.

This virus can be prepared readily by the veterinarian in charge of the immunizing operations from sick hogs found in the outbreak. Such animals are best fitted for this purpose when they are at their sickest. The necessary appliances could be furnished in a sterile condition by the experiment station supplying the serum. When no sick hogs are available, the virus stored previously should be used.

All this kind of work should be done at state's expense, as it is done with a view of general protection and as under such an arrangement immunization can be made more universal. Fur-

thermore, local veterinarians in general practice, who should in order to assure prompt action be employed for this work as much as possible, should be given opportunity to familiarize themselves as much as possible, with the post-mortem diagnosis of the disease, the preparation of the virus, and the method in general. This should be arranged for at the serum plant of the experiment station and at state's expense.

In addition to the measures here recommended arrangements should be made by the managements of stock shows, sales, etc., with the live stock sanitary authorities to have all swine exhibited properly immunized, so as to eliminate such institution as possible disseminators of infection.

The ordinary methods of quarantine, disinfection, and proper disposal of carcasses should also be adhered to.

THE COLORADO AGRICULTURAL COLLEGE VETERINARY MEDICAL ASSOCIATION, meets every Monday evening at 7 o'clock in Pathology Hall.

DR. C. B. OUTHIER, Salinas, California, has been traveling through Mexico for the past three months, spaying cattle, and expects to return home soon. He has been in the heart of the Mexican revolution; his headquarters having been at Chihuahua.

DR. GEORGE A. HANVEY, JR., Veterinarian, Sixth U. S. Cavalry, stationed at Fort Des Moines, Iowa, was married December 7th to Miss Georgianna Dunn, of Nottoway, Virginia. We wish them all the joy and happiness that wedlock can bring them.

PROF. REICHEL, of the University of Pennsylvania, will read a paper before the members of the Veterinary Medical Association of New Jersey at its annual meeting at the Trenton House, Trenton, January 12. Other prominent men from New York will also probably address the association.

TETANUS.*

BY DR. P. F. BAHNSEN, AMERICUS, GA.

The presentation of a paper on Tetanus before an Association, some of whose members are credited with constant recoveries from this dread malady in from 75 per cent. to 90 per cent. of their cases seems indeed presumptuous, especially so by one who, in the interest of truth and candor, must admit his personal experience to have been a serial succession of fond hopes and dismal failures. This paper was born neither in the hope of advancing any new and unheard of theory nor in resentment of the flattering reports which, of late, have crammed the pages of professional and semi-professional—or rather commercial-professional literature; but its aim is to stimulate sane, unbiased reflection as regards the therapeusis of this horrible affliction instead of basking in contentment upon the foamy laurels of untried neophytes or the glittering endorsement of an occasional enthusiast. Right here I want to emphatically disclaim any intention of personal reflection toward anyone, even should their published reports fall under the hammer of my criticism.

In addressing a paper on Tetanus to this body I am sure it is superfluous to dwell upon definition, history and aetiology of the disease producing factor, these facts are more or less familiar to all present; and then, it is especially the practical phase of the subject which I expect to bring to your attention.

A brief résumé of the pathogenesis of the Tetanus Bac. will aid in getting the subject clearly before us.

1. Fresh cultures of from two to five days old are only mildly toxic, the toxicity of the culture increasing progressively with its age.

* Read before the Alabama Vet. Med. Association at Montgomery, July, 1910.

2. Long continued washing of extremely toxic cultures deprives the spores of their toxine, and thus prepared even large doses prove harmless when injected into susceptible animals. Excessive, continued heat (80° C.) also destroys the toxicity of the culture without destroying the spores. Yes, these cultures, harmless, or nearly so, within themselves when injected into a bruised region or accompanied by grit, dust or foreign bodies, or when introduced into a region previously injected with a negative chemotactic fluid, such as Lactic Acid, invariably regain their virulence and produce the disease.

3. The toxines, no doubt, represent a specific secretion of the bacillus. It is soluble in water and insoluble in alcohol, chloroform and ether, and extremely poisonous. One c.c. of the filtrate of a highly virulent culture is capable of killing a 1,000-pound horse. Other animals require relatively larger toxic doses.

4. The action of the toxines is only manifest when injected subcutaneous, intra-muscular, intra-venous or intra-cerebral; even large doses administered by way of the digestive organ proving absolutely harmless. (Hutyra & Marek.)

Admittedly Tetanus is not primarily the result of an infection with the ladle shaped Bacillus of Nicolayer, but the characteristic symptoms are the consequence of an intoxication, the nervous system showing a strong selective affinity for the toxins eliminated from the constantly sporulating bacillus. And yet, the intensity of this intoxication is regulated by the same fundamental laws which govern the development of an infectious attack. Briefly stated these factors are: The variable susceptibility of the affected individual, the virulence of the invading organism—to which, in case of intoxication, the strength of the destructive toxins should be considered—and the condition of the atrium of infection, which may be either favorable or unfavorable to the development of the invading micro-organism. A careful consideration of these conditions enable the practitioner to prognosticate, with reasonable certainty, the outcome of almost any attack; the errors in a prognosis thus founded is

invariably due to baseless presumption as regards the period of incubation, but I will come to this later.

The soil, especially such as is strongly permeated with manure, stands convicted of being the most common source of infection. We therefore find tetanus a frequent sequela of such wounds as offer the greatest possibility of soil contamination. Being obligative anaerobic, deep penetrating infections offer a more favorable development for the bacillus; this accounts for the preponderance of cases following such injuries as deep penetrating wounds to the lower parts of the limbs, castrations, especially with clamps, and penetrating wounds on the ventral body surface. Not infrequently our most painstaking examination is without result, the atrium of infection is closed, the site of infection cannot be located—we have a cryptogenetic infection.

The pathogenic action of the bacillus is not manifest immediately upon its introduction into the animal. A variable period of time intervenes between the introduction of the cause and the development of its effects. This lapse of time constitutes the period of incubation. Its length, depending upon the conditions previously named, *i. e.*, susceptibility of the individual, virulence of the invading organism and favorable or unfavorable conditions for the development of the bacillus at the site of infection, enable us, with reasonable certainty, to determine the prognosis of an attack. We find the period of incubation to vary from twenty-four hours to as much as three or four weeks. Such variable development cannot be, and is not, without significance to the outcome of an attack; however, the possibility of a secondary infection, subsequent to the date of first injury, must not be overlooked. Mistaken presumptions in this matter naturally lead to erroneous deductions. Not only do these factors sway the pendulum between certain death and ultimate recovery, they also form the paramount consideration as regards the period of convalescence in case of recovery.

No doubt, some of you will say: "How about our treatment?" Have you ever tried this, or that, or something else? Well, if I were addressing an assembly of my patrons who had

entrusted me with the care of their lockjaw cases during the past eighteen years, I doubt having the courage to own up to my many trials, to the times when at their expense I have hoped the defeat and failure were the only result in reason to expect; to say nothing of the many times when I myself, spurred by the fire of enthusiasm, expected flattering results from a line of treatment because it came endorsed by those who are acknowledged leaders of undoubted ability and unquestioned integrity, only to enlarge my store of disappointments.

How easy it is to come to an empirical conclusion in regard to our treatment. Accepting a few successful terminations as the result of our treatment is much like casting bouquets at one's own ability, and to use the expression of the Irish maid: "We love to talk about it!"

Any well read veterinarian can recall the record of flattering reports which have lit the pages of veterinary journals, and even text-books, filled them with new hope only to find it a bubble, a delusion. And yet I firmly believe that in all cases the records are correct, the recoveries have occurred; but, and there lies the pinch, the natural tendency toward recovery has been completely overshadowed. *Many cases die annually as a result of ill-advised and indiscreet treatment that might have recovered if let alone.*

Who among the older practitioners has not tried "Cannabis Indica" on the strength of Mr. Richard Rutherford's experience—quoted in Finlay Dunn's Veterinary Medicine; or "Gelsemine," at the suggestion of Dr. W. L. Zuill, published in his translation of Friedberger and Froehner; or, with Cadot tried sodium sulphate and bicarbonate in large and continued doses. Did not the carbolic acid treatment—a la Bacelli—receive unstinted praise at the hands of both veterinary and the medical profession? All veterinary literature, foreign as well as American, resounded with eloquence the curative virtues of phenol solutions. As to failures—well, they never made good reading, consequently few are reported. I shall not attempt to enumerate *all* the drugs that have, first and last, been endorsed as "gilt-edged" in the treatment of tetanus—Lugol's solution

intratracheally; oxygenated water intravenously, cholesterine hypodermatically, orally curare and potassium bromide, chloral hydrate both orally and in rectal infusion, atropine, morphine, pilocarpine and arecoline—I even find tallianine among the list that has been tried and endorsed.

Operative surgery has been advanced to fill the wants of a certain and effective panacea. Neurectomy, in case of tetanus resulting from injuries to the hoof, has been endorsed by Rosco, who claimed recovery as a result of his operation.

Depleting the patient by venesection, both with and without additional treatment, has been endorsed. Thus "Habicht" drew 9 liters of blood every fourth day, injected iodipin 25 per cent. every following day and rested every third day—two straight recoveries. "Crinon" extracts 10 liters and repeats after three days, then 10 c.c. antitoxin and 120 grammes of bromkali for four days—recovery in two weeks. "Dumas" duplicated this feat.

But the most flattering surgical cure emanated from the pen of a Winterset, Iowa, M. D. Honest Injun like he confessed that his was but an improvement over the procedure of a Mr. Miller, who merely knocked the patient in the head and fractured his skull; even this crude method led to certain recovery. The story was so good it jarred my think-pan, and I assisted four tetanus patients to "lie down with patriarchs of the equine world" according to the formula of "W. F. Sterman." Other veterinarians who have tried it have told me of equal results, yet the editor of *Clinical Medicine*, in August number, 1909, says: "We have received a number of very interesting favorable reports from veterinarians concerning the Sterman operation upon horses suffering from tetanus. In one horse operated upon in this city, however, the method seemed to be an entire failure."

Says Dr. Sterman in his article (*April, 1909, Clinical Medicine*): I refer to the peculiar gas formation with the toxins, both primarily and secondarily. This gas is present everywhere, from the beginning of toxin-formation, is intensely irritating to the nerves even at the seat of inoculation, etc."

Really I must confess that in more than two hundred cases that have come under my observation, this gas production has not been observed; nor do I recall a similar recorded observation in any veterinary literature at my command (excepting the reference to this matter in Vol. 2 of *Merrillat's Surgery*, page 447). "Brunner in 1898 proved that gaseous changes are notably active from the very period of incubation." I am inclined to the opinion that in those cases where gas-production at the point of infection is manifest, it is due to the simultaneous infection of the wound with the *Bac. Oedematis maligni*. And, as regards the irritating effects at the seat of inoculation, my observations have been exactly to the contrary. Animals showing distinct lameness and intense pain, as the result of an injury, prior to the development of the general symptoms of tetanus, invariably show less lameness after. I look upon the complete suppression of pain in such a case at the site of inoculation as an almost certain indication of a fatal attack. (Of course, intense rigidity naturally modifies any manifest symptoms of lameness—mechanically.)

Dr. Sterman admits that: "The equine race is the one most frequently affected, and my experimental work has been with it. A horse may be very dangerous in the violent throes of tetanic convulsions, but when the skull is opened, and the gas escapes with a hiss, the horse quickly regains his feet, soon nickers for something to eat and soon eats it, and the trouble is ended then and there." *How simple, how marvelous, how certain*, if it could only be true.

If I appear in the rôle of an iconoclast, it is with the hope that when our present illusion concerning the cure of tetanus has been destroyed a more formidable line of therapeutics will be introduced; with this apology I will review the claims and the virtues of Tetanus Antitoxin Serum. As all of you know within the last few months, a general revision of the strength or rather standardization of commercial veterinary antitoxin has taken place. This did not occur without the usual presentation of both sides to the controversy. I will call your attention to

- the statement of Dr. T. B. Rogers, of Woodbury, N. J., who states (REVIEW, vol. 37, page 507): "A great many of those horses are in a tetanus district, and before that method (immunization with antitetanic serum) was instituted, many cases occurred. In the six years this method has been followed, we have never had a death from tetanus, and we are giving a serum *that did not read over fifty (50) American units.*" The author argues with good reason. If 50 units are sufficient for protection, why increase the cost of treatment by injecting 1,500?

As a prophylactic, the value of antitetanic serum can hardly be questioned. The only question involved is the size of the dose necessary to effect immunity. Of course cases are on record where animals developed tetanus after receiving an immunizing dose of the serum, this may have been due to a special susceptibility of the animal so injected, or to an inferior product of antitetanic serum, either or both. Universally, however, the serum has, as a prophylactic, secured the endorsement of the general practitioner; not so with the larger, so called "curative doses." It is true a good many cures (?) have been reported, but a careful study of those cases that give a complete anamnesis show that they were the class of patients that naturally had a fair chance to recover.

Right here I want to assert that, in my opinion, meteorological conditions have a certain influence upon the severity of the disease. To illustrate, in 1908 I only lost two out of seventeen tetanus cases, yet under similar treatment I was forced to haul five patients in rapid succession to the crematory in 1909 (two of these cases were trephined) and then, taking new hope in large doses of antitetanic serum, three more followed at an enormous expense to the owner. This made a total of eight fatal terminations out of eleven cases in 1909. The later part of 1908 I was eager to treat tetanus patients; one year after I studiously avoided any case that looked unfavorable to me. It is needless to say I have predicted fatal results and seen recoveries, and have held out hope of recovery, and then my patient died. I

have seen recoveries of well developed cases under the most unfavorable circumstances, and absolutely without treatment.

Practically the curative doses of antitetanic serum have not been successful, neither in my hands nor in the practice of professional colleagues, of my personal acquaintance, though they annually treat very many cases.

And our record stands by no means isolated.

According to the "Statistical Veterinary Sanitary Report of the Prussian Army (Anno 1906)," forty-nine horses suffered from tetanus, 70 per cent. died. Out of ten treated with tetanus antitoxin, eight died, and in two cases it even failed as a prophylactic. Anno 1907 of the same report records forty-five cases with 9 per cent., or four recoveries to 91 per cent. fatal termination. Again the report states: "Medical treatment as well as antitoxine injections were without result. Again in 1908, forty-five were affected with tetanus, eight recovered and thirty-seven died, a loss of approximately 82 per cent. Again we find in this report: "Injections of antitoxin had no influence on the progress of the disease."

Dieudonné and Chapellier, two French veterinarians, in separate articles, recorded in the *Rec. de Med. Vet.*, 1909, laud the value of immunizing doses of antitoxin, but deny any virtue to the curative claim of this preparation.

Pochhammer, in a very elaborate report, *Experimentelle Untersuchungen ueber die Entstehung des Starrkrampfes und die Wirkung des Tetanustoxines im menschlichen und tierischen Organismus* (published in *Volkmann's Samml. klin. Vortraege*, 1909), comes to the following final conclusion:

The toxins hidden and fixed in the nervous system are not affected by the antitoxins.

Serum injections are therefore useless in well-developed tetanus.

The value of prophylactic injection is, at least, doubtful.

Even in actively high-immunized animals fatal tetanus results from continued injection of toxin in small doses, since

parts of the toxins are taken up by the nervous system where they accumulate.

In the *Medical World* Dr. J. C. Dreher gives the details of two cases of tetanus treated successfully with physostigmine; a third case sent to a hospital and treated with antitoxin died. In fact medical literature is rather barren of reports of successful treatment of tetanus with antitoxin. Why so?

AUTHOR'S CORRECTION.—Dr. D. B. Clark desires to correct the name "Mr. A. Meyer," as it now appears in his paper on "John's Disease," published in the December issue of the REVIEW to "Dr. K. F. Meyer."

IF some of our readers who have hospitals of medium size will advise Dr. L. B. Michael, of Collinsville, Ill., where he can obtain plans for such a structure, they will confer a favor upon an appreciative brother. The doctor's address is 628 East Main street.

SOME changes and additions to the committees appointed by President Glover of the A. V. M. A., published in the November issue of the REVIEW. Dr. S. B. Nelson's name is added to the Executive Committee; Dr. Geo. H. Berns' name replaces Dr. Nelson's name on the Finance Committee; Dr. L. Van Es' name replaces that of Dr. D. S. White on the Committee on Intelligence and Education.

DR. W. REID BLAIR, who has been the faithful secretary of the Veterinary Medical Association of New York City for the past five years, having served with three presidents, the first two years of which were with the late lamented Roscoe R. Bell, was honored by being elected to the presidency of that organization at its annual meeting in December. The association is to be congratulated.

DR. H. PRESTON HOSKINS, Philadelphia, Pa., was elected National Secretary of the Alpha Psi Fraternity at its recent biennial convention held in Chicago the last week in November. We congratulate the doctor as the recipient of this honor which was bestowed upon him, though not in attendance at the convention. We also extend the congratulations to his father, our old friend and colleague, Dr. W. Horace Hoskins.

IMMUNIZING AGENTS AND THERAPEUTIC SERA IN VETERINARY MEDICAL PRACTICE.*

BY W. H. DALRYMPLE, BATON ROUGE, LA.

With the rapid advances made in recent years in reference to the use of the various vaccines and sera, the time seems fast approaching when the therapeutic art will have resolved itself into what might almost be termed "vest pocket" medication, not only with respect to the treatment of disease in the human family, but also in the lower animals with which the veterinarian has to deal. And with our ever-increasing knowledge and experience concerning the action and results from the use of these products at the present time, this form of therapy would seem to be, not only the ideal, but likely to be the method of the future in veterinary as well as in human practice.

No doubt the exhaustive investigations into the cause or causes of immunity, and the various theories based thereon, such as the exhaustion theory, the retention, the acclimatization, the antitoxin, Ehrlich's side-chain, Metchnikoff's phagocytosis, etc., and later, the opsonic theory of Wright and Douglas, have all contributed to a more extended use and a fuller understanding of these valuable biologic agents.

As a leader in this form of therapy, most of the credit must, we think, be given to the late Louis Pasteur for his classical experiments with anthrax vaccine, which is now in use, more or less, in all civilized countries where anthrax or charbon is known to exist, and, when properly and intelligently employed, has yielded very gratifying results.

The Pasteur lymph is a double-dose vaccine, although not used simultaneously, as is the case with some other similar products.

* In connection with report of Committee on Intelligence and Education, A. V. M. A., San Francisco, Cal., Sept. 1910.

The culture from which the first lymph is obtained has been exposed to a temperature of about 42 or 43 degrees Centigrade, in the presence of oxygen, for about 24 days, which tends to attenuate the organism and render it non-sporogenous. In the case of the second lymph, the exposure is only for about twelve days, under similar conditions, which leaves it less attenuated and, therefore, stronger, so to speak, than the first lymph. The first and second lymphs are injected subcutaneously at an interval of from ten to fourteen days. Immunity, which lasts for about twelve months, is conferred on the animal in about from ten to fourteen days after the administration of the second lymph. Since, therefore, it takes in the neighborhood of twenty-eight days to obtain immunity from the use of the double-dose vaccines, the most satisfactory results have been obtained in anthrax-infected districts when vaccination has been performed early in the spring; so that immunity has been reached before the season of the year sets in (summer usually) that favors the development of the infection on the previously-infected area or territory.

Failure to attend to early vaccination has, in our opinion, tended to lessen the value of the product, and has brought about adverse criticise of it without just cause. Or, in other words, owing to vaccination not having been adopted until the disease has become existent, the animals have become exposed to infection before immunity was reached, and frequently with untoward results.

Another method of vaccination against anthrax more recently employed is the sero-simultaneous method of Sobernheim, which consists of an injection of serum from a hyper-immunized animal, and one of virulent culture at the same time.

This method is said to confer a quicker immunity and seems to have given more or less satisfactory results in the hands of those who have used it, although the writer has not had any personal experience with it.

Still another vaccine, put up in the dry or pellet form, is in use. It is a single-dose vaccine; is said to be prepared from dead

organisms, and confers immunity in a shorter period of time than the double-dose preparations.

The writer is not in a position to express an opinion as to the most effective method or form of anthrax vaccine. Provided, however, the material has been carefully prepared and standardized attention paid to the expiration date, which is stamped by the manufacturers on some of the products, and vaccination performed sufficiently early in the season to insure immunity before animals are exposed to natural infection, good results seem to have followed the use of the vaccines at present upon the market. However, in order to secure the maximum of success with these products, in addition to what has already been stated, their use ought to be solely in the hands of the qualified veterinarian, as there are certain antiseptic precautions necessary to success with such products with which the layman is not expected to be familiar. And, in the judgment of the writer, it would add greatly to the success of preventive vaccination against anthrax, and save a great deal of valuable live stock property, if the manufacturers of these products would lend their aid in seeing to it that only qualified veterinary practitioners could handle vaccines of this character.

The Black-leg vaccine of Arloing, Cornevin and Thomas needs no special allusion in this short report, as the writer believes that most members of the profession are familiar with the success which has followed its use for quite a number of years, and which still seems to continue.

Bacterins or autogenic bacterial vaccines appear to be coming more into use as time goes on; and recent professional literature seems to show quite a number of successes with this form of microbination.

This system of medication seems to be based upon the opsonic theory of Wright and Douglas, viz., that the patient's blood-serum has within it a chemical substance which has the power of acting upon the invading organism in such a way as to render its destruction by the phagocytes much more easy. These antibacterial substances, or opsonins (from the Greek,

meaning "prepared for being eaten") in the serum which seem to influence the phagocytic action of the white cells, are said to act by chemically uniting with the invading bacteria, and so altering them that the leucocytes are able to destroy them, while not stimulating or otherwise affecting the leucocytes themselves.

There are many different opsonins in each blood serum; one variety said to be for each kind of bacterium; and the opsonic index may be estimated against such as staphylococci, streptococci, the tubercle bacillus, etc.

By the opsonic index, just alluded to, is meant the ratio of the organisms swallowed by leucocytes incubated in the patient's serum, to those engulfed by an equal number of leucocytes incubated under similar conditions in healthy serum.

Dr. Archibald, of California, very ably alluded to this method of vaccination in an address at the Chicago meeting last year; and the successes he seems to have had, as well as those of others, brought out in the discussion which followed, would certainly suggest a bright future for this form of medication in those cases in which such is indicated. It may be, and we think it quite likely, that the important investigations of Wright and Douglas in connection with the opsonins, will be of immense assistance to the veterinary, as well as to the human, practitioner of medicine.

A most important step in vaccination is that of endeavoring to immunize young cattle to tuberculosis. Quite a number of tests have been conducted both in this country and abroad, but we believe we are correct in saying that the method has not, as yet, proved to be a universal success from a purely economic point of view, and requires more time and further experimentation.

Serum therapy seems to be advancing with rapid strides, if we are to judge by the many serums that are now upon the market.

The one longest in use by the veterinary profession is, perhaps, the antitetanic. This tetanus antitoxin has its strong advo-

cates; while there are others who appear to have little faith in its efficacy. Still those of us who are able to "hark back" to the days prior to its use, and can remember the hopelessness with which we viewed our tetanus cases; and then compare those days with the present time, when we have so many recoveries from the use of the antitoxin, and the large number of cases in which the disease fails to develop when an immunizing dose has been administered, although conditions are much the same now as then, cannot but feel that this serum has proved itself a very valuable agent, and a decided advance in the treatment of this hitherto much more dreaded disease.

Personally, the writer has had very good results from the use of this serum, even as a therapeutic agent. It is, however, as a preventive that it is of the greatest service. A year or two ago we made the request of a professional friend that he use immunizing doses of antitoxin whenever the opportunity offered itself, and that he keep a record of his results, which he very kindly consented to do; and out of some 428 cases in which he had used the serum in this way, he did not have a single case of tetanus develop, although in our part of the South, there seems to be a great deal of tetanus infection. The cases mentioned included orchotomies, punctured wounds, deep lacerated traumasms, open joints, etc.

Such evidence as this, and others, no doubt, have had similar experience, is sufficient I think to warrant the continued use of this serum, at least as a prophylactic, but also as a therapeutic agent in those cases where the symptoms have become manifest.

At the same time this, like other biologic products, ought to be standardized before being placed upon the market.

Perhaps the greatest advance in serum therapy in recent years, and one which will leave the most indelible impress over the entire country is the Dorset hog-cholera serum to protect our hogs from the ravages of that fatal and expensive disease. It is to the credit of our National Department of Agriculture that it has so faithfully persevered in its endeavor to ameliorate the condition of our hog-raisers in this direction, although hav-

ing expended a large amount of money in the effort; and our Bureau of Animal Industry, and Dr. Marion Dorset, of the Bio-Chemic Division, in particular, is to be doubly congratulated on the final results achieved in perfecting this immunizing process.

Sufficient work has already been done in various states with the serum to verify the earlier results obtained by the Department of Agriculture; and it is impossible to predict the vast possibilities of our great hog industry brought about by the discovery of this valuable method of protection. An impetus has been given to hog raising in sections of the country where, previously, it had been almost totally in abeyance, or only a secondary branch of farm practice; and it has stimulated the farmers in many localities to improvement in the quality of their animals, which, hitherto, they were indifferent towards on account of the risk of almost total loss from hog-cholera.

It is encouraging, also, to note the almost universal interest that is being manifested in the Dorset serum by the different state authorities. Many of the state legislatures have appropriated funds for the erection and equipment of plants for the preparation of serum for their hog raisers; and in some cases it is difficult to prepare serum fast enough to meet the demand, so many and urgent are the calls for it by the farmers.

Some states distribute the serum free of charge, while others make a charge for it. The writer, with some others, is of the opinion that the former is the more satisfactory, when it can be done. In this way, it is possible to exercise a better control over its use; to place it in the proper hands; and to obtain more accurate records of the results. When a charge is made, some may not care to be at the expense of purchasing it, and so neglect to immunize their hogs, with the result that the disease is permitted to spread from the herds so neglected. In other words, we believe that, with the no-charge method, the maximum number of animals will be immunized; greater discrimination made as to who uses the serum; and the maximum of good results obtained.

We do not know of any similar product at the present time that ought to be more uniformly potent than this serum, as it is outside the sphere of commercialism, and is in the hands of the various state authorities themselves, such as live stock sanitary boards or commissions, experiment stations, etc., who are in the position to test and know its absolute potency before being used upon the farmers' hogs.

Other sera are on the market as commercial commodities, such as antistreptococcic, "antistrangles," canine distemper, etc., all of which appear to be giving more or less satisfactory results, if we are to judge from the records of those who have used them.

As we have already mentioned, the results already obtained from the use of the different therapeutic and immunizing vaccines and sera are sufficient, we think, to suggest a still brighter future for this line of medication in veterinary practice; and the more intimate our knowledge becomes concerning the laws of life, and those abnormal processes which occasion what we term disease, the more rapid will our progress be in the discovery of those biologic products which seem to approximate more closely the processes which nature employs in effecting cures, or, restoring the abnormal to the normal condition. It is most important, however, in order to protect the veterinarian, and the property of the client who employs him, that all of these products should be standardized as to their potency. If this is not done, their efficacy will be minimized; their effect may be either nugatory or dangerous; and the uniformly salutary effect that should follow their administration, which ought to be more or less positive, will always be left in doubt, to the dissatisfaction of everyone concerned in their use.

DR. D. F. STEVENS, Assistant State Veterinarian, Mount Morris, Ill., in renewing his subscription says: "This is my twenty-first year as a subscriber to the REVIEW, and should I continue to practice twenty-one years more, my name will still be on the subscription list."

THE DIAGNOSIS OF GLANDERS BY THE PRECIPITATION REACTION OF KONEW.*

BY JOHN R. MOHLER, V.M.D., WASHINGTON, D. C.

Since the discovery of the glanders bacillus in 1883 by Loefler and Schutz great progress has been made in the determination of glanders. The greatest difficulty in the recognition of this disease lies in the fact that many glandered horses do not show positive symptoms until the later stages of the disease. Such horses affected with occult or latent glanders, which are apparently not even suspicious cases, must be considered as the principal distributing agents of the infection. The early diagnosis of glanders is therefore one of its most important phases to the practicing veterinarian, and with this definitely established in a stable of horses, subsequent action is clear as to the measures which should be taken to protect the owner from further loss and personal danger. Our knowledge, methods and resources in coming to the conclusion that a given horse is or is not affected with glanders has gradually broadened, until to-day there are at least eight distinct methods by which the diagnosis of glanders may be made, namely:

1. Physical examination.
2. Post-mortem examination.
3. Auto-inoculation.
4. Extirpation of the submaxillary gland.
5. Guinea pig inoculations.
6. Mallein test.
7. Serum agglutination reaction, or this reaction combined with the diversion of the complement.
8. The precipitation test of Konew.

* Presented to the A. V. M. A., San Francisco, September, 1910.

As all of the first seven methods have been fully treated and discussed at former meetings of this association, attention will be directed in this paper only to the precipitation reaction.

This method for the diagnosis of glanders was recently brought to the notice of the bureau in a preliminary report submitted by Dr. D. Konew, Director of the Bacteriological Laboratory in the Veterinary Institute of Charkow, Russia. It is based upon the fact that the precipitins are formed in the bodies of infected animals from the time the infection first occurs, and probably at an earlier period than the other antibodies such as the agglutins, opsonins, etc. However, our knowledge of the development of all these antibodies is extremely meager, owing to the difficulty of discovering them and to the further fact that they exist in minute quantities and are diffused throughout the tissues of the entire body.

Even when the smallest traces of these precipitins are present in the blood serum of glandered horses, Konew states that with a concentrated solution of glanders bacilli he is able to find even these slight traces and thereby obtain a positive reaction to his test. This solution of the glanders micro-organism is prepared by dissolving the growth which occurs on a two-day-old agar culture with an 8 per cent. antiformin solution by using about 10 c. c. of the latter to each agar culture. Antiformin is the patented name of a disinfectant, made by adding sodium hydrate to a solution of sodium hypochloride and is on the market at 60 cents a pint. Its activity seems to be due to an intense oxidation. This solution of antiformin has recently been attracting the attention of those bacteriologists who are interested in sputa examinations, on account of its ability to dissolve various forms of bacteria generally found in the sputum without affecting in any way the bacillus of tuberculosis, thereby permitting the latter to be more readily detected on microscopic examination. It has this same ability to dissolve the bacillus mallei, and in two hours at room temperature the washed culture previously referred to is completely dissolved by the solution of antiformin. If the culture dissolves quite rapidly Konew adds

to this solution another washed culture of greater density in order to obtain as a final result a saturated or concentrated anti-formin solution of glanders bacilli. This solution is at first strongly alkaline, but is neutralized by means of a 5 per cent. solution of sulphuric acid. The solution is then filtered, first by ordinary filter paper, and later by the Berkefeld filter, in order that the fluid will be homogeneous without any undissolved bacilli being present. This fluid constitutes the one component part of the precipitation reaction, and as a name to distinguish it from the other soluble albumens Konew has termed it "malleasa," which is analogous to the terms tuberculase, pyocyanase, etc.

According to its discoverer the precipitation reaction is carried out in the following manner: "The blood taken from the jugular of the horse to be examined is collected in a glass container and then allowed to remain at room or incubator temperature. The separated serum which is thus obtained serves as the second necessary fluid for the precipitation reaction. In order to produce the reaction one c.cm. of the malleasa is poured into a glass test tube of 3 to 4 mm. in diameter and 15 cm. long, so that the liquid in the tube is about 3 cm. in height. Then about the same quantity of the blood serum from the suspected horse is taken in a Pasteur pipette which is introduced into the tube containing the malleasa in such a manner that the point of the Pasteur pipette reaches the bottom of the tube. Not until then is the serum allowed to pour very slowly under the malleasa. Inasmuch as the serum has a higher specific gravity it remains on the bottom, while the malleasa is forced up. The free end of the pipette is then covered with the finger and the pipette is carefully taken out, so that the serum is not mixed with the malleasa. Such a mixing should also be avoided during the introduction of the pipette into the serum. The two solutions must only come in contact at one point and then the reaction will be very marked.

In case of a positive reaction, that is when the serum is obtained from a horse affected with glanders, a ring of white

cloudiness develops at the point of contact of the two clear solutions, as a result of the precipitin formation, which is particularly marked in good daylight when the tube is placed in front of a window against some dark object. According to the duration of the disease, the white ring develops at various times and in varying intensity. In severe and chronic cases of glanders the serum produces the ring immediately; in slight affections when the lesions are not very marked in the animal, the precipitation reaction appears only in 5 to 15 minutes." In our experiments the cloudy ring at the point of contact of the two fluids was made to appear more distinct by adding to the malleasa several drops of an aqueous solution of methylene blue for the color contrast. This white cloudy zone is somewhat suggestive of the white ring formed by the presence of albumen in the nitric acid test of urine. (See Figure 1.) After the union of the



FIG. 1. PRECIPITATION REACTION FOR GLANDERS.

- (a) Negative reaction; control test made with blood serum of healthy horse.
- (b) Positive reaction; serum obtained from an occult case of glanders. Note the cloudy ring at the point of contact of the two fluids.
- (c) Positive reaction; blood serum obtained from case of nasal glanders.
- (d) Precipitation reaction with serum from horse with chronic farcy.

receptors in the blood serum with the products of bacterial disintegration, further change takes place, which results in a precipitation brought about by a kind of fermentative action. This may be explained in accordance with Ehrlich's theory of the

receptors of the second order. Such receptors possess in addition to the haptophore group, a ferment-producing group called the zymophore group. The receptor seizes the food substance in the bacterial extract with the haptophore group and produces precipitation, manifested by cloudiness, with its ferment-producing group.

The two important factors which make this test a practical one are (1) the very simple technique required and (2) the fluids used in securing the reaction are without danger to the operator, a very great advantage in such diseases as glanders in which the veterinarian in his examination is always subject to the dangers of infection. Konew has applied the test to 150 horses which were simultaneously tested by the agglutination reaction and with mallein. While in most cases the results of the precipitation reaction corresponded with those of the mallein and agglutination tests, at the same time the precipitation reaction had the preference in that it did not give doubtful results; that is, in the cases in which the agglutination reaction appeared in dilutions of 1 to 400 and 1 to 500, the precipitation test gave negative results. On the other hand the precipitation reaction gave clear and positive results in certain cases of glanders in which the lungs and mediastinal glands showed only two or three nodules without involvement of other tissues. As controls on these results he used the serum of horses which were suffering with surgical diseases, some with high temperatures; also of horses which had been injected with anthrax, erysipelas and hog cholera vaccines. In no case was a precipitation reaction obtained, but at the point of contact of the two clear fluids the optical border could be distinctly seen without any cloudiness. Based on these results, Konew drew the following conclusions:

- I. By using the concentrated solution of glanders bacilli (*malleasa*), the precipitation reaction can be applied as a diagnostic method even in the earliest stages of glanders.
- II. As a result of the simple technique and the short time required for examination (about one hour), the precipitation reaction should be preferred to any other method of diagnosis.

III. Blood from the horses to be examined should be taken before the injection of mallein.

IV. The solution of malleasa must be titrated in accordance with other standard serums before they are given out in practice, and therefore they should only be prepared in bacteriological laboratories.

Unfortunately the time has been so short since this method for the diagnosis of glanders was first presented that a sufficient opportunity for the careful consideration of its merits has not been presented. However, a number of interesting experiments have been conducted by the bureau with malleasa, although it is not desired to draw any definite or general conclusions from the results.

Recently two cases of farcy came under observation to which the precipitation test was applied and in each case the white cloudy ring was quickly apparent, thereby confirming the diagnosis reached by physical examination. As one of these cases originated in a contractor's stable, the twenty-one horses therein were at once quarantined and subjected to both the mallein test and the precipitation reaction. The latter was made first with the result that the serum of only one horse (Jerry) in the stable gave the white cloudy ring reaction. This horse happened to be the mate to the horse showing lesions of farcy and stood in the stall adjacent to the latter. The following day the mallein test was applied to all the horses, and no reaction occurred with the possible exception of the horse Jerry, which developed a rather atypical local reaction. This animal showed a preliminary temperature of 103.5° and would not have ordinarily been injected owing to the difficulty of interpreting the after temperature in such cases, had it not been desirable for the purpose of controlling the precipitation test. The autopsy on this horse showed four bean-sized nodules of glanders in both lungs, thus confirming the precipitation test. In another instance where nine horses were purchased by the bureau at a sales stable for a different series of experiments, both the mallein and precipitation tests were applied with the result that one horse reacted to the

precipitation test, but showed only a thermal reaction of 102.4° F. without any local swelling, following the mallein injection. This horse likewise showed a few glandered nodules in the lungs and bronchial lymph glands at autopsy. During my present visit in the West the occasion has presented itself in a number of instances to apply this test to exposed or suspected cases of glanders. In all, I have made thirty-one tests with this method both in the field and at the laboratory, and up to this time there has not been an indefinite result recorded. Of these thirty-one animals, five were clinical cases of glanders, one was suspected of being so diseased, three were occult cases proved by post-mortem to be glandered, while the remaining twenty-two were apparently normal.

From the information herein presented, it seems probable that the precipitation reaction will be found to be a satisfactory diagnostic agent for glanders, qualified to do all that has been claimed for it, but the experiments thus far conducted are so few that definite conclusions along this line are withheld pending further investigation of sufficient cases to make a very thorough test.

My sole object in presenting this new method for the diagnosis of glanders to this association is for the purpose of having the test tried out by those veterinarians who have the necessary facilities for making this quite easily applied diagnostic agent. A letter just received from my co-worker, Dr. Stafford, states that since my absence from Washington, he has tested a total of thirty-seven horses. Of these thirteen gave positive reactions to the precipitation test, nine being clinical and four occult cases of glanders as shown by post-mortem examination.

DR. JOHN F. DE VINE, Chief Veterinarian to the Department of Agriculture of New York State, was elected President of the United States Live Stock Sanitary Association at the annual meeting of that grand organization in Chicago, December 5 to 7. We congratulate both the association and the good Doctor.

RETROSPECTION, INTROSPECTION AND PROSPECTION.

By R. A. ARCHIBALD, OAKLAND, CAL.

Sufficient time has elapsed since the meeting of the American Veterinary Medical Association in San Francisco to permit an analysis or short historical review of the results of said meeting, and at the same time perhaps to consider briefly what are and will be the immediate and future effects of same.

With possibly one exception it must be admitted that the meeting was a success more especially from a literary standpoint as the literary program has never been surpassed at any previous meeting in the history of the organization.

The exception to be noted was the attendance and this feature was disappointing, but in a great measure this was counterbalanced by the enthusiasm demonstrated by those who were in attendance. The paucity of numbers was of course due to locating the meeting so far from the center, numerically speaking, of our veterinary population. At the same time we believe that it was certainly a privilege well worth crossing the continent to be able to sit and listen to the various reports of committees, particularly the committee on diseases and on tuberculosis. No more interesting and instructive report has ever been presented to the Association than that submitted by Dr. Rutherford, in which he portrayed in detail what had been accomplished by the International Commission to study methods for control of bovine tuberculosis during the past year.

Dr. Melvin's presidential address revealed the marvelous and material progress that our profession has made and is making. The addresses delivered by Drs. Hughes and Merillat, who graphically presented features for the benefit of the practitioner and the problems pertaining to sanitation which were illuminated by Dr. Mohler and others furnished an intellectual enter-

tainment which we believe was as good as could be produced even in the classic environments of some of our great Eastern cities.

The clinic must also be considered as a success, and the clinic committee aided and directed by Drs. White, Merillat, Blattenberg and others has reason to look back with some degree of pride at an achievement that was absolutely above criticism. The operations were practical, as a general proposition the results were good and all surgery in connection therewith was performed in a humane and scientific manner. In this connection a point of interest was the comparison between Eastern and Western methods of restraint and operative procedure.

From a business standpoint the results of the meeting apparently left nothing to be desired. The secretary's records show a notable addition to our membership roll, totalling some 196 new members, and the many lines laid out to still further increase the roll of membership and to increase the efficiency and importance of the organization all point to a most satisfactory and successful meeting.

The effect upon the standing of the profession on the Pacific Coast has already begun to show material evidence. Some western states are as a result actively engaged in the organization of veterinary societies. In other states the tendency has been for the members of the profession to come closer together, to increase their organization and combine forces for the purpose of working for the common good. It has demonstrated to many who were skeptical that we are on the professional map and has acted as a stimulus towards promoting a feeling of unity to such an extent that events of great importance toward the elevation and advancement of the veterinary profession may be looked for in the near future as the result of such unity.

From the many letters received we have reason to conclude that the efforts of the Entertainment Committee to provide social entertainment were in a great measure successful; and that most, if not all, of our visitors left here with a fraternal feeling and a warm spot in their hearts for the veterinarians on the Pacific slope.

Let us prophetically and with the eye of a seer take a glance at the future and endeavor to foresee what may be the result of this experiment of meeting in the extreme west. We can look into the future and see the greatest and grandest Exposition of all time in full operation in California during the year 1915. This Exposition will be held to celebrate the completion of the greatest and most stupendous engineering feat of modern times, the opening of the Panama Canal. The citizens of this glorious state have already raised sufficient funds in the sum of \$17,500,000 to finance this great undertaking. What then is more natural or more likely than that the veterinarians of America, yes of the world, as well as those who are following other vocations, will wend their way westward on that occasion to participate in this great celebration and what would be more natural or more appropriate than that the American Veterinary Medical Association should hold its meeting in California in order that veterinarians could attend both functions at one and the same time.

The fact that the profession in California has demonstrated its ability to care for a convention on such or any other occasion, removes in our opinion the only obstacle towards the consummation of such an event.

We desire at this time with a full realization of what the effort will entail to notify the veterinary profession of America, that when the proper time comes, the members of the veterinary profession in California will issue an invitation to the American Veterinary Medical Association to meet again on the Pacific Coast in 1915.

WE take pleasure in presenting below the strong commission appointed by President Glover, of the A. V. M. A.:

INTERNATIONAL COMMISSION FOR THE STUDY OF METHODS OF
CONTROL OF BOVINE TUBERCULOSIS.

J. G. Rutherford, Chairman; Veranus A. Moore, E. C. Schroeder, W. D. Hoard, Frederick Torrance, John R. Hurty, J. W. Tomlinson, W. C. Edwards, C. A. Hodgetts, John R. Mohler, J. W. Flavelle, Mazyck P. Ravenel, Joseph M. Cudahy, M. H. Reynolds, Secretary.

IMMUNIZATION OF CATTLE AGAINST TUBERCULOSIS.

BY DR. WILFRED LELLMANN, PROFESSOR OF THE NEW YORK UNIVERSITY.

In an article of the November issue of the AMERICAN VETERINARY REVIEW, Drs. Schroeder and Mohler, of the Bureau of Animal Industry, published their results and ideas of different methods of immunizing cattle against tuberculosis, and drew therefrom the conclusions as to the usefulness or uselessness of the various methods. Amongst others, they claim also the research of bovo-vaccination, according to the method of von Behring. This claim, to judge from their own description, is neither exact nor correct, and is capable of producing a wrong impression upon professional men who are but superficially familiar with von Behring's method. In the first place, "bovo-vaccination" is a term introduced by von Behring, which means vaccinating cattle with Bovovaccine, a vaccine especially prepared at the Behringwerk. It consists of tubercle bacilli of the human type which have been attenuated by special method and process, and which were originally obtained from one culture, in order to get a vaccine of a most uniform quality. Furthermore, it is not correct to use the term "bovovaccination" in connection with immunizing cattle against tuberculosis, but with von Behring's Bovovaccine, just as well as tauromanization is generally accepted as immunizing cattle with Tauruman against tuberculosis. The mere intravenous injection with a vaccine containing tubercle bacilli of the human type does not justify the statement or the claim of having used the method of bovovaccination of von Behring. It is not the method of intravenous injection which claims any originality, but it is the preparation of the vaccine itself. Of course, nobody can be prohibited from using the term "bovo-vaccination" in literature, as it might simply mean vaccinating cattle. However, any well-read man ought to know that this

term was only introduced by von Behring and applying solely to his method, and any other use of the term must be considered a misrepresentation. For this reason I feel that I have to answer the article of Drs. Schroeder and Mohler in this regard, as I have done some research work according to the original von Behring method myself, with the Bovovaccine prepared at the Behring-werk, for six years past. Furthermore, I disagree as to the usefulness and uselessness of this method in vaccinating young cattle in practice. It certainly requires a systematic way in going about bovovaccination, combined with sanitary conditions, without which no infectious or contagious disease could be successfully combated. I feel safe in stating that bovovaccination, according to von Behring's method, combined with strict sanitary principles, *i. e.*, the best available, will accomplish in time a considerable decrease of tuberculosis amongst cattle. It is not my intention to recapitulate all the different ways in going about this systematically. Every practitioner who has interest in bovovaccination can amply inform himself about sanitary methods of Ostertag and Bang, which in several regards could perhaps be modified as to render them valuable and practicable, together with a systematic and continuous bovovaccination of cattle and their progeny. Thus the resistance against tuberculosis could be strengthened by degrees and the percentage of loss gradually cut down to a very low margin.

An important notice appears on page 544!

THE COLORADO VETERINARY MEDICAL ASSOCIATION will meet in Denver January 20, holding their annual banquet in the evening. Arrangements are being made with the local (Denver) meat inspection force for a pathological exhibit for the Meat Inspection Class of the Division of Veterinary Science of the Colorado Agricultural College to be given in the forenoon of the 20th just before the state association meeting. The practitioners of the state are invited to join the Meat Inspection Class of the college in attending this exhibit. The Live Stock Show of Denver will be held during this week.

REPORTS OF CASES.

CASTRATION OF CRYPTORCHIDS.*

By A. W. WHITEHOUSE, V.S., D.V.S., Walden, Colo.

I have never been satisfied with the operation via the inguinal canal. Probably my technique is deficient, but in a large number of cases I have never succeeded in the prescribed hooking of the testicle with two fingers, and have always had to insert my whole hand. Nor have I in this operation received any aid from the gubernaculum; probably because the hand is too close to it while breaking in. In nearly every case I have had to push aside one or two folds of intestine before reaching the testicle. My experience has usually been that the packing has been insufficient. I have had to relieve inclusions of intestine per rectum, cast again and repack with one hand in the rectum, trusting to the owner or some bystander with partly disinfected hands to stitch the packing in the scrotum. I have tried no packing at all, with the result of immediate descent of the intestines. There has always been copious suppuration and a slow recovery with a death rate of about 25 per cent.

In one case I have pushed the sheath to one side and incised the prepubian tendon not far from the middle line. This case recovered nicely but slowly, owing to the copious escape of peritoneal fluid. In any case the scrotum is the hardest part of the body to disinfect thoroughly, and a horse tied in the ridgling position is almost impossible to keep clean during the operation, and can only be dressed perfunctorily during the healing stages.

Moreover, while a natural inguinal hernia is bad enough, an artificial one is far worse.

The operation through the high flank is probably a very old one, but seems to have been entirely discarded by veterinarians. My excuses for attempting to revive it have been, first, the extensive use of the operation many years ago by an empiric on the Laramie plains with no very severe death rate in spite of

* Read before the annual meeting M. V. V. A., Omaha, July, 1910.

septic methods; and, secondly, my own familiarity with a similar technique and absolute success (no deaths in 900 head) in spaying heifers.

It is only to gratify the insatiable maw of Dr. Kaupp that I am reporting at this early date, as two were operated on on June 2 and one on June 15, and none of the wounds are completely healed. For comparison I am also reporting on one operation done on June 2 via the inguinal canal.

No. 1.—June 2, 1910. Inguinal canal. Gray gelding 3 years old. Cast in ordinary castrating position. Scar recognized on left side. On right side a small body detected with difficulty, supposed to be a testicle. Cut down on, proved to be an enlarged lymphatic gland. Determined on the old operation and disinfected with some thoroughness. Breaking in, found the testicle about 4 inches from the abdominal wall, but was able to bring easily to the surface and remove with the emasculator. Packed with gauze (boiled and soaked in 2 per cent. creolin), stitched scrotum and allowed to rise. There was immediate evidence of acute abdominal pain. Gave morphine sulphate gr. iii. subcutaneously. Rectal exploration failed to find inclusion of intestine or to relieve the pain. Spent about an hour trying to apply a pressure pad externally, the pain steadily increasing. Cast the colt again, when the pain was at once relieved. Arranged to pack with one hand in the rectum, the owner disinfecting his hands to do the stitching. For some reason, probably being rattled, inserted the right hand in the rectum instead of the left and had to withdraw and disinfect in a hurry. Then succeeded in packing satisfactorily with sterile gauze bandages. Allowed the colt to rise, when the evidence of pain was much less. Gave 100,000,000 anti-suppurative, and to this injection alone I attribute the recovery of the colt. There was dull pain till 36 hours later, when the packing was removed, and though there was great swelling and stiffness, there was hardly any suppuration, and on June 19 the colt had practically recovered. He lost a good deal of flesh and was off his feed for four days. Nos. 2, 3 and 4 were operated on by practically the same method; the details, which are not yet by any means perfected, varying very little. With 2 and 3 an injection of 100,000,000 anti-suppurative was given at the time of operation; with 4, the night before. No difference seems to arise from this procedure. Nos. 2 and 4 were given 2 oz. chloral hydrate ball per rectum about 2 hours before the administration of chloroform; the advantage being that they were cast with less

struggling. There was no saving on chloroform and they were more helpless and violent in coming out of the chloroform than No. 3, who was chloroformed only.

No. 2 was first cast with an ordinary castrating tie for inspection of the scar, and allowed to rise. No. 3 was said by the owner to have two scars and was not inspected at all, but was operated on on the left side (the testicle proving to be on the right), and No. 4, being gentle, was inspected in the standing position.

In Nos. 2 and 3 the operative area was not prepared beforehand; in No. 4 the flank was copiously anointed with 5 per cent. carbolized vaseline overnight. No advantage has appeared to attach to this procedure.

The instruments (excepting the knives), cloths and silk sutures were boiled for fifteen minutes and then about 3 per cent. carbolic was added to the water. The knives stood fifteen minutes in 95 per cent. carbolic and were then added to the other instruments; the catgut was merely soaked in 5 per cent. carbolic.

The horse was cast in the stable (to avoid wind) with the operation area uppermost, the English hobbles being used; he was then profoundly anaesthetized and a liberal area shaved from the point of the ilium to the fold of the flank about eight inches wide in transverse diameter. The upper hind leg was released from the hobble and drawn backward. The shaved area was scrubbed for some minutes with soap water and 3 per cent. creolin, and the whole side moistened with the same solution. Next the shaved area was dried with alcohol and painted with tincture of iodine. A cloth about 1 yard square was wrung out from the antiseptic solution and laid over the field of operation. (Later, before suturing, two other cloths were laid on the quarter and ribs to protect the end of the thread.) An incision about six inches long was made in the cloth and through this the operation was performed. The fold of the flank was grasped firmly in the left hand, tensing the skin, the operator leaning over the horse's loin, and the skin divided for about five inches in a vertical direction. The seat is slightly forward of the furrow where the hair goes in two directions and begins about three inches above the fold of the flank, reaching to within three inches of the external angle of the ilium. The cloth was then pinned to the edges of the wound with about a dozen tenacula and artery forceps. The loose connective tissue was divided with great care, the haemorrhage controlled and the aponeurosis of the external oblique exposed. A division of about

one inch in length was made between the fibres with the knife and this was extended with the fingers as far as possible. Then with the hand in a cone shape, right if working on the left side, and vice versa, the abdominal wall was penetrated and the peritoneum ruptured. The internal ring is about four inches from the wound and the gubernaculum is easily followed and the testicle brought to the surface. In No. 3 in which I operated on the wrong side, I found the testicle before reaching the lower ring, but do not believe that there would be any difficulty in reaching it in a well-starved horse. Following my spaying procedure, but using more stitches, I united the aponeurosis of the external oblique with two catgut sutures, and the skin with five or six silk, all interrupted.

Not one of the three horses showed any pain, general disturbance, or loss of appetite. There was copious escape of peritoneal fluid from the wound, considerable abdominal oedema, and in all cases suppuration of the skin wound. The wounds were dusted with boric acid and a little absorbent cotton allowed to dry on over the stitches, the surrounding area being tarred.

With proper antisepsis and the use of antisuppurative vaccine, and especially with general anaesthesia in a covered building, I believe there is no fear of general infection. In my future cases I intend to suture the peritoneum and the deep muscles to prevent the escape of serum, and I must find some more efficient method of disinfecting the deep layers of the skin. A bichloride pack for twenty-four hours is applicable to gentle horses, but what to do with unbroken ones is at present beyond me.

A VERY UNUSUAL CASE OF OESOPHAGEAL OBSTRUCTION IN A HORSE—OPERATION—RECOVERY.

By L. A. MERILLAT, Professor of Surgery in the Chicago Veterinary College.

The subject is a bay work horse, six years old, weighing 1,500 pounds and in splendid physical condition. When presented for treatment was reported to have been unable to eat or drink for forty-eight hours, although constantly attempting to do so. The examination revealed no systemic disturbance, no soreness of the throat, and no swelling or bulging to account for the absolute inability to drink even a single swallow of water. In attempting to drink, the very first swallow would be immediately re-

jected through the mouth and nose and unlike a case of sore throat there was no attempt to take two or more consecutive swallows; on the contrary, some moments always elapsed between each attempt to satisfy the thirst. The solid food given for the purpose of making observations was handled in about the same manner; a mouthful would be picked up, masticated, and then promptly rejected chiefly through the mouth. There was no ptyalism, no retching, no champing of the jaws, no movements of the cervical portion of the oesophagus to indicate that the patient was choked, and palpation of the throat and the neck revealed nothing unusual, nothing abnormal. The countenance, however, indicated dire distress.

DIAGNOSIS.—After some hours fruitless effort to arrive at any positive conclusions as to the nature of the condition at hand, an attempt was made to pass a stomach tube first by way of the nasal cavities and then by way of the mouth. In each case the tube met a formidable obstruction in the region of the pharynx, but as there was no dyspnoea to indicate foreign body in the pharynx, and as nothing could be felt in the upper part of the oesophagus, it was thought that the tube might be blocked by spasmodic contractions of the oesophagus. The patient is then placed upon the operating table and chloroform administered. In the state of anaesthesia and with the neck fully extended, the probang (consisting of a stomach tube and stilette) when passed through the mouth into the oesophageal infundibulum could be seen to be pushing an indistinct object toward the surface of the neck at the level of the larynx, but no amount of pushing could dislodge it in a downward direction. A five-inch incision was then made down the neck beginning at the bifurcation of the jugular in order that the hand might be admitted directly to the object. Direct palpation of the object through the walls of the oesophagus now showed it to be the size of a hen's egg, firm in consistency but compressible. It was now plain that the patient was choked with a wad of hay at a very unusual location. The end of the stomach tube then removed brought out no food particles, but emitted a fetid odor, showing that gangrene of the oesophagus, the inevitable termination of prolonged chokes, was already present.

OPERATION.—The patient was first carried into profound anaesthesia, and then the mouth was forced open as far as possible with the mouth speculum. The left hand was passed into the pharynx through the fauces, which, on account of the deep

anaesthesia was not difficult to do. The object was grasped through the incision with the right hand and by squeezing upon it, it was forced with some difficulty into the palm of the left hand within. Upon being withdrawn, the object was found to be a wad of alfalfa and molasses compressed into a perfectly dry mass the size and shape of a hen's egg. Its surface was streaked with blood and emitted a very fetid odor. The wound was wiped out with tincture of iodine and with the exception of an orifice for drainage was closed up with interrupted sutures, and packed with gauze.

AFTER CARE.—Liquid diet, of which the patient partook very readily, for five days, careful feeding for two weeks, and strict attention to the surgical wound which healed without serious reaction, restored this unusual surgical subject to perfect health in four weeks.

CANINE LYMPHATIC LEUKEMIA.

By A. T. KINSLEY, M.Sc., D.V.S., Pathologist Kansas City Veterinary College.

Lymphatic Leukemia is not a common disease of domestic animals. It is more frequent in the dog and ox than in the other



From photograph showing extreme emaciation, roughness of coat and enlargement of submaxillary lymph node.

domestic animals. Twenty-one cases were reported in the Berlin clinic from 1886 to 1894 from a total number of 70,000 dog patients in that clinic during that time. A case of Lymphatic



From photograph of spleen of above dog, showing leukemic nodules.

Leukemia was reported by the writer in the AMERICAN VETERINARY REVIEW, Volume XXX., page 436; another case was reported in the Kansas City Veterinary College Bulletin, No. 29. On June 20, 1910, Dr. J. C. Flynn, of Kansas City, Mo., presented a dog at the Kansas City Veterinary College clinic that was of considerable interest, probably because it was an unusual case. On a casual examination of the dog it was thought

that he was affected with tuberculosis. This probable diagnosis was based on the appearance of the dog, which, as is shown in the accompanying illustration, was very much emaciated and showed enlargement of the superficial lymph nodes, and had a general dejected appearance that is common in the later stages of tuberculosis. There was also more or less disturbance of the digestive and circulatory organs. Unfortunately no hematologic study was obtained of this patient because of the fact that he died soon after being presented at the clinic. A careful autopsy revealed that practically all of the lymph nodes were enlarged, more or less hyperplastic, and in some cases there was central necrosis. The spleen contained several leukemic nodules as shown in the accompanying illustration. These nodules were composed of lymphoid cells. There were several small leukemic infarcts in the liver and kidneys which were found on microscopic examination to be lymphoid cells. The red marrow was slightly discolored and of a semi-gelatinous consistency.

"ALFALFA CLOG."

By Dr. J. L. HOVLINAN, Assistant State Veterinarian, Franklin, Neb.

The description of the following case would apply to a great number that have come under the observation of the writer.

A large gelding in good condition had been working every day. I was called to see this horse June 24, 1910. Owner said his water was bothering him, as he had treated him for the same trouble before; but on arriving I found him eating hay as though nothing was the matter; the owner still insisting it was his water. Luckily, the horse urinated while we were talking, and after he did so, had one of those severe cramping spells, which would last from twenty to thirty minutes, rolling continually; after which he would get up and eat hay for nearly half an hour, apparently all right. I inquired as to the kind of feed the horse had been having and he said he had been feeding prairie or wild hay, but had run out of it and had fed alfalfa hay for a week. I at once suspected the trouble and made a rectal examination. Could feel a large mass of hard material in the posterior part of the great colon, but none had worked far enough back into the rectum so that I could remove it.

TREATMENT.

First Day—I gave a physic ball and raw linseed oil in quart doses every three hours until one gallon had been given; injections per rectum every hour, and Fl. Ex. Nux Vomica, 3ii; Spts. Ammo. Arom., 5i; Ac. Salicylici, 3ii, as a dose to be given every three hours.

Second Day—Fl. Ex. Nux Vomica, 3i; Spts. Ammo. Arom., 5i; Ac. Salicylici, 3ss, as a dose every three hours, with rectal injections every hour.

Third Day—Arecolin, grs. i-ss hypodermically in the morning and Eserine, grs. i-ss hypodermically in the afternoon.

This caused the horse to do a great deal of straining. I made another rectal examination but still nothing was within reach.



The figures on each ball denote the inches in circumference at the point where the figures appear.

After this the horse began to bloat and was tapped at 9 p. m. He died the next morning. I will say here I have always been very successful with this mode of treatment, where the "clogs" have not been too large to be forced back in the floating colon or rectum where they could be reached by the hand.

On post mortem I found eight of those balls, some of them nearly round; and No. 17 was lodged in the floating colon about four feet from the rectum, No. 19 next, and then No. 21. Great effort was put forth to expel the "clog" and in doing so No. 17 had been moved about six inches; but it had become so dry and filled the lumen of the bowel so tightly that the inner coat of the bowel had stuck to the ball and was carried along with it the full distance it had moved. The rest of the balls were found in the large colon. The remaining material in the bowels was a

very soft mass caused by the physic that had been given. The balls were coated with a kind of a mucous coat which the physic seemed to have no effect on.

I find this "alfalfa clog" trouble in old horses, where teeth are poor and the alfalfa is not properly masticated; also in colts where they are shedding their teeth, from three to four years old.

TREATMENT OF PURPURA HEMORRHAGICA WITH STREPTOLYTIC SERUM.

By JAMES J. JOY, Detroit, Mich.

During the past six months I have treated in the neighborhood of thirty cases of purpura, and in all of them have used Streptolytic Serum. I have had far better success than with any of the old line treatments. Not only have I had quicker and cleaner recoveries, but saved the attendant and also myself a great deal of work and worry. This is not my first experience with serums in this disease, for I have used them for some years, but with very unfavorable results in a great many cases; but I am pleased to say that in all the cases treated by me during the time that I have used Streptolytic Serum I have not been disappointed in one case. Previous to the use of this serum I have been obliged to perform tracheotomy in a great many cases to keep my patient alive. In all my cases since using it I have not had occasion to perform it once. I enclose with this communication a short history of three cases.

Case No. 1.—Bay horse, 1,100 pounds; seen by me for the first time September 6, 1910. At that time showed very marked symptoms of purpura. Edematous condition of the limbs, abdomen and head; very stiff and could scarcely be moved. Had shown no signs of "pink-eye" or any "shipping fever." September 7, p. m., greatly improved, edema gradually disappearing, and on September 12 all traces of affection had disappeared.

Case No. 2.—Black gelding, 950 pounds; seen by me September 28, a. m. Owner said he had just recovered from "shipping fever" about a week before. Edema very well marked, breathing quite labored, appetite quite impaired and had no desire for water. Gave 30 c. c. serum. Condition much improved, but on September 30, gave 20 c. c. serum. Continued to improve and was in use October 5.

Case No. 3.—Bay mare, 1,200 pounds; seen first on October 30. A typical case of purpura. Edema of head and limbs very marked. Breathing labored and could scarcely be moved. Received 50 c. c. serum. Improvement from the 31st of October was very rapid, and on November 5 was in condition to be used. I will state regarding the cases mentioned as in all the others treated by me, that with the exception of few doses of iron tonic, no other medicines were used. I have made up my mind from experiments that one full dose, or about 50 c. c., will give better results to the practitioner than repeated small doses.

AN INTERESTING CONDITION.

By WARREN L. THAYER, D.V.S., Worcester, Mass.

Following is the description and breeding of a heifer calf, the picture of which I mail to you under separate cover. This



is a four-weeks-old calf, black and white in color. The sire was a registered Ayrshire; dam was a three-quarters Ayrshire and

one-quarter Jersey. The queer feature about this calf is that the white on her is very straight hair, while the black is a very coarse wool with the texture of wire. The hair on legs is straight; on tail, coarse black wool, except at the tip, which is finished with a tuft of straight white soft hair; each of the ears are nicked with a very distinct V, as may be plainly seen in the photo.

The mother of this calf was pastured in a field which was directly across the road from a family of colored people; their children have used this pasture all summer as a playground. What we wish to know is, have these children anything to do with the condition of this calf's coat?

— DR. L. FREDENBURG, of Council Grove, Kansas, says: "Enclosed find check for \$3 in payment of my subscription to 1912. Thanking you for the help you have given a lonely country practitioner in the past, I remain, etc."

BUFFALO HERDS.

The government now owns three herds of buffalo: The Montana herd of 47, the Wichita herd of 19 and the Yellowstone herd of 95. The American Bison Society, which has been trying to save the bison from extinction, has just taken a census of the breed, announces that there are 2,108 animals in North America, and that this shows a steady increase and that the danger of the animals becoming extinct seems to have passed.—*The Live Stock Journal*.

INOCULATED PIGS DID WELL.

At Omaha last Saturday a bunch of eighteen pigs, averaging 155 pounds, sold at \$8.50 per cwt. A history attaches to them. July 28, at an average of thirty-five pounds, they were inoculated and turned in with a lot of sick pigs at the Omaha yards, where experts kept them under close scrutiny for six weeks. During that period all the uninoculated pigs died, but all the healthy, inoculated stock went through the test and was put on feed, doing well until sold. The demonstration was an unqualified success from start to finish and the fact that the inoculated pigs, after being exposed to cholera in its most virulent form for six weeks, showed no symptom and continued to thrive while going through a fattening process ought to be sufficient to satisfy the most skeptical of the efficacy of this method of treatment.—*Breeder's Gazette*.

ARMY VETERINARY DEPARTMENT.

INSUFFICIENT PAY FOR VETERINARIANS OF THE QUARTERMASTER'S DEPARTMENT.

The *Army and Navy Register* of December 8 says:

The quartermaster general of the Army, in his annual report of the operations of the quartermaster's department for the fiscal year ended June 30, 1910, says, among other things:

Veterinarians.—Great difficulty has been experienced in securing competent veterinarians at the compensation of \$1,200 per annum fixed by law, without chance of promotion.

Veterinarians in the cavalry and field artillery receive on entrance into the service the pay of second lieutenants, with allowances of quarters, fuel, and light authorized by law to officers of that grade. The entrance salary of veterinary inspectors, Bureau of Animal Industry, Department of Agriculture, is \$1,400 per annum, with chances for promotion and increase. Under these circumstances, it is not likely that men qualified by education, training and experience to fulfill the duties of veterinarians for the quartermaster's department, which differ in no respect from those expected of veterinarians in the cavalry and field artillery service can be secured at the compensation allowed to them by law.

It is recommended that measures be taken to invite the attention of Congress to this anomaly, and that the law limiting the pay of veterinarians in the quartermaster's department to \$1,200 per annum be modified.

REMARKS.—As this item has made its way into the daily press in a corrupted form, we wish to state, what is not generally known, that the army has two different classes of veterinarians. Those appointed to the cavalry and field artillery regiments, after passing a severe entrance examination, have a fixed military status and draw the pay and allowances of second lieutenants with increase of pay after each five years of additional service. The veterinarians employed by the Quartermaster's Department have no military status but are considered civilians because engaged by contract as needed at \$100 per month, and if no longer needed, they are discharged. Their number is not fixed by law, but during the Philippine insurrection, 1899-1902, there were over sixty of them employed in the Philippines alone. For years they were not examined as to their professional fitness, and many of those so employed were not graduated veterinarians. Continuous complaints of their incompetency led the present Quartermaster General to demand of them a civil service exam-

ination, which, although not severe, at least prevents non-professional men from getting into this department of the army. Their pay is surely insufficient for a college graduate, but their social status is yet worse, so that young veterinarians of good education and breeding who happen to be attracted by the advertisements, leave the position as soon as practicable after becoming acquainted with its iniquities.

But the whole and real trouble is that there ought to be no such civilian contract veterinarians in our army in time of peace. Their usefulness and application are limited by their civilian status in a military organization. At this point we disagree with the Quartermaster General when he states "that the duties of veterinarians of the Quartermaster's Department differ in no respect from those expected of veterinarians in the cavalry and field artillery service." They differ materially. The Quartermaster veterinarian attends to the ordinary veterinary practice only, assisted by civilian blacksmiths, teamsters and packers, while the veterinarians of cavalry and field artillery control in a military manner the farriers and horseshoers, are in charge of the administration of veterinary hospitals, and, above all, act periodically as instructors in hippology to officers and instruct daily farriers and horseshoers. This fact does not reduce the value of the Quartermaster veterinarian, but rather enhances the value of the veterinarian of cavalry and artillery.

Naturally, then, the cavalry and field artillery need capable, commissioned veterinarians most, but the Quartermaster Department, with its valuable mule-stock and its newly installed remount depots, the engineer companies, the signal-corps companies, the army service schools, all need commissioned veterinarians badly; and yet they are not provided for. Just now, when the proposed aerial corps detracts the attention of otherwise prudent and conservative military men from necessary improvements in the old established and reliable branches of the service, of which the veterinary service is one, no one can tell how long it will take our army to possess a properly organized army veterinary corps such as all civilized armies maintain since the time of the great Napoleon. No such corps is in sight in our army at present, which necessitates the piecemeal legislation as recommended above by the Quartermaster General, who, as is well known, fully appreciates the services of competent veterinarians for the army generally.

O. S.

ARMY VETERINARY NEWS.

A board of officers, consisting of two cavalry officers and veterinarians Plummer and Jewell, has been appointed to meet at Fort Riley, Kansas, to revise the veterinary supply table of February 2, 1902. The board has sent a circular letter to all army veterinarians stationed in the States, submitting several questions regarding the improvement of the medicine table and of veterinary equipments for field service. It is hoped that material improvements will be recommended by the board, not only in the supply of more up-to-date medicines, dressings and equipments, but that also the question of technical veterinary advancement by means of periodical courses for army veterinarians will be brought to the attention of the military authorities.

The Cavalry Equipment Board, now meeting at Rock Island Arsenal, Ill., has requested reports of several army veterinarians about the best means to transport the necessary veterinary medicines and instruments for veterinarians and farriers for emergency treatment in the field. The board thinks that no farriers', horseshoers' and saddlers' supplies should be carried on the horse ridden by any of the soldiers mentioned.

The inquiries indicate that the board is on the right track to solve problems that have baffled the best intents and purposes of army veterinarians and of officers of cavalry in general. The field artillery and other driving organizations are not too pressed for transportation of these supplies.

THE MISSOURI VALLEY VETERINARY ASSOCIATION will hold its mid-winter meeting in Kansas City, January 24th, 25th and 26th. This meeting should be a record breaker in all respects. The program is surely sufficiently attractive and, being held in one of the greatest cities of the Middle West, there is nothing wanting to insure a large attendance. Two days will be devoted to the presentation and discussion of the many splendid papers that have been prepared. The third day will be devoted exclusively to a clinic and practical demonstrations. This will include a demonstration of the preparation of anti-rabic vaccine, with a discussion of the same, by a Pasteur Institute representative, Dr. Nisbet, and a demonstration of intradermal reaction of tuberculosis in the skin, at the root of the tail of a bovine, with a discussion. Also a discussion of hog cholera serum treatment, demonstrating certain phases not covered last year.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

CAUSTIC ACTION OF CARBOLIC ACID [*Hy. Taylor, F.R.C.V.S.*].—Liquid carbolic acid had become crystallized in the bottle, where it was. The bottle was placed in the cow-byre over one of the cows, with the supposition that the heat of the place would melt it again. The bottle was laid on its side and the cork left slightly loose. As expected, the acid thawed out. It dropped on one cow, giving rise to an extensive eschar, which in a few days became hard, leathery and when sloughing out left a large granulating sore extending from the external angle of the ilium to the hock and spreading according to an illustration that accompanies the description of the case, from the stifle to nearly half the width of the lower ischio-tibial region.—(*Veter. Record.*)

FOREIGN BODY IN THE HEART OF A CALF [*Wm. Moodie, M.R.C.V.S.*].—The animal has never shown any signs of illness during its life, and it was only at the slaughter house that the lesions were found. In the left ventricle there was imbedded in the thickness of the myocardium a piece of wire two inches long and hooked at one end by a bent part which measured $\frac{3}{4}$ -inch in length. The calf was seven weeks old. There was no inflammation of the pericardium nor endocardium nor of the fleshy substance of the heart. Externally and internally the whole organ seemed perfectly healthy.—(*Veter, Journ.*)

POST PARTUM TETANUS IN A COW [*Norman Meyers, L.V.S.*].—This cow had calved several days before, and during the next twenty-four hours everything went satisfactorily with her. Then she showed sickness, had her uterus irrigated with garden hose, received lots of home remedies and then presented tetanic symptoms at the head and neck. Careful examination failed to discover any external wound. Perhaps the garden hose had

been the germ carrier to some wound of the genitals during parturition. If this was correct the incubation would have been in this case from 24 to 36 hours. The animal received no treatment.—(*Veter. Journ.*)

POLL-EVIL [*W. Cargill Patrick, F.R.C.V.S.*].—Resulting from a bad fall, a six-year-old mare had a swelling at the poll of the head. Treated with cold applications, blisters and finally by the opening of an abscess, disclosing new growth of bone on the atlas. The case did well for a while. Then the mare had some difficulty in moving about in her box. She had marked loss of co-ordination in her actions and then a slight enlargement was noticed over the right side of the atlas. Suspecting spinal cord complications, the mare was slaughtered. At the autopsy, the atlas was found with a large osteophyte overhanging the neural canal to some extent. “The right wing was thickened, the articular surfaces of that side more or less constricted and a distinct gutter extending from the anterior foramen to the posterior was present, the latter being entirely absent. The unnamed foramen of the wing of the atlas was nearly four times larger than normal.”—(*Veter. Journal.*)

FRACTURE OF THE FOURTH CERVICAL VERTEBRAE [*A. W. N. Swanson, M.R.C.V.S.*].—The animal had colic and was relieved by ordinary treatment. Once during the attacks, he had reared and fallen backwards on its poll. The next day he seemed very uncomfortable and if any one came into his box he invariably turned away towards a corner. Then he had fits, turning round and round in circles, always from the right to the left. A painful swelling appeared on the right side of the neck. The fits increased and in them the horse seemed to get its neck twisted to the left and was unable to get it back in position. Yet when he succeeded in doing so, then the fit would pass off. One morning he is found unable to get up and he dies. At the post mortem a fracture of the left transverse process, through its entire length with the posterior portion of the right process of the fourth cervical vertebrae were found. The horse lived twelve days with such lesions.—(*Ibidem.*)

TORSION OF THE STOMACH IN A DOG [*John L. Perry, M.R. C.V.S.*].—A dog is reported sick. He is believed to have been poisoned. The owner has given him an emetic of salt and water

and the dog makes constant attempts to vomit. He dribbles at the mouth and throws out gases. The abdomen was hard, tense and painful. Morphia and hypos. Sodaæ are administered. While under the influence of the morphia a probang is passed and some obstruction met with at the stomach end of the oesophagus. Tympanitis and pains increase. Gases from the stomach are evacuated by puncture with the trocar. Dog died. Post Mortem.—Stomach twisted on its superior attachment from left to right—a half turn. The whole organ was dark claret color and gorged with blood. It contained a pint of solid and liquid. The hole made by the trocar was found in the right side of the organ."—(*Ibidem.*)

PARASITIC GASTRITIS IN A MARE [E. Wallis Hoare, F.R.C.V.S.].—Ten-year-old thoroughbred mare commenced to fail in condition and has capricious appetite. She soon gets in a wretched state, anemic, hide-bound, with a dry scaly affection of the skin of the back and thorax. Various treatments were tried, but all without results. She at times showed uneasiness when swallowing her food. After four months of treatment she was destroyed. At the autopsy the stomach was found much contracted and its walls very thick. The villous portion of the organ showed a number of corrugations, whose raised portions were white in color and the depressed parts of a dark red. Among the ingesta were a number of blood clots partially digested. The case was pronounced one of parasitic gastritis. The parasite present belong to the species *Strongylus Gracilis*.—(*Veter. Record.*)

ACUTE LAMINITIS TREATED SUCCESSFULLY WITH ADRENALINE [Vet. Capt., C. H. Jolliffe, F.R.C.V.S.].—The first case relates to a four-year-old gelding, which was in observation for urticaria, and had had a fall during exercise. He became very lame, was put in slings, struggled against them, and was found one morning with all the symptoms of a severe attack of acute-laminitis of all four feet with complete impossibility to move or stand up. One c. c. of a 1 in 1,000 adrenaline solution was injected in the digital arteries of both fore legs. A 6-drachm ball of aloes was also administered. The next day the horse was standing and showed a slight improvement. Two c. c. of a 1 in 2,000 adrenaline solution were injected on each side in all four limbs, while the horse was lying down. The following morning

the horse was found standing up and moving freely. Purgative acting. For two successive days the improvement became more marked, but as there remained some soreness all round, 2 c. c. of adrenaline solution 1 in 1,050 were injected in each side of all four fetlocks. The general action of the horse continued to improve and the animal resumed work in a short time.

The second case was that of a black gelding which had laminitis of both fore feet. Shoes were taken off, feet poulticed and purgative administered. As instead of improving, the disease seemed to increase; 4 c. c. of a 1 in 2,000 adrenaline solution were injected on each side of both fore fetlocks. The second day after, improvement was manifested and continued to progress satisfactorily, so that in a week the animal could trot, being only slightly lame. He resumed his work a few days after.—(*Veter. News.*)

INFECTIOUS JAUNDICE IN DOGS [*E. Wallis Hoare, F.R.C.V. S.J.*.—No matter what may be the true nature of this affection, a peculiar complication of the disease is the occurrence of invagination of the intestines, which is indeed frequently observed. The author relates the history of two cases that came under his notice recently. Two fox hound pups, three months old, in fine condition were brought to him for treatment. Both had the characteristic yellow color of the skin and of the mucous membranes. Milk and lime water with one-tenth of a grain of calomel were prescribed. Both dogs improved, but died suddenly, one in one evening and the other during the night of the same day. At the autopsy of one there was found an invagination of the ileum, nearly one foot in length and in the other a similar lesion only six inches long. The liver in both showed various shades of yellow, was more or less friable. In neither of these dogs during life had any symptoms of invagination been manifested. No vomiting, no straining, no evidence of abdominal pains.—(*Veter Record.*)

HERMAPHRODITISM IN OSTRICH [*Stanley Elley, M.R.C.V. S.J.*.—In April the author was requested to castrate about a dozen cock birds, which it was intended to use later as foster parents for young chicks. The birds were in the kraal, to all appearance fully grown male birds, with feathers of from four to five months' growth. They were in good condition, some being red-legged. The first two birds were operated upon successfully

and the third bird was chloroformed. But after making the incision and attempting to locate the right testicle, no trace of it could be found. It was said that all the birds were between seven and ten years old, so that the generative organs should be fully developed. Failing to find the right testicle, the writer broke through the fold of peritoneum, which normally separates the two testicles, and endeavored to locate the left one, but in place of a testicle he found what felt like a small ovary. Tracing this along, two flabby slightly elongated structures, somewhat the size and shape of an ordinary bean were noticed, one attached to either side and the left about an inch anterior to the right. The whole mass was removed and upon further examination proved to be an imperfectly developed ovary, to either side of which was attached a rudimentary testicle. The total weight of ovary and testicle was barely two ounces. After completing the operation the cloacum of the bird was then examined and the penis was found developed but resembling that organ as seen in a young bird of about six months.

The reasons to report the case are: 1. Because it is the first time that such condition in the ostrich is recorded. 2. Because it may be of service to any other operator confronted with a similar condition. 3. As it may serve to explain some cases of disappointment, which one so frequently hears of, when birds are camped off for breeding but fail to pair.—(*Agric. Journ., Cape Good Hope.*)

FRENCH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

ENCEPHALOID SARCOMA GENERALIZED TO BOTH KIDNEYS OF A PIG [Prof. Cadeac].—Neoplasms are rare in pigs. This case was observed in a six-months-old animal, with the lesions occupying the mesenteric glands and having spread to the kidneys. The primitive tumor had a discoid shape, oval and measured 15 centimetres in length with 10 in width. It was mammillated by the presence of round tumors varying in size from that of a cherry to that of a big nut. The whole was surrounded with adipose tissue. The tumor was rather of soft consistency. A transversal section showed its lobulated arrangement with a yellowish aspect and some hemorrhagic spots. The neoplasm had spread to both kidneys and formed nodular tumors, 15 to 20 on

each organ, some of these being yellowish gray and others surrounded with red effusion. The kidneys were of pale yellow color. The tumors extended into the renal substance. The microscopic examination of the principal growth revealed its nature of encephaloid sarcoma.—(*Journ. de Zootech.*)

SUPPURATING HYGROMA OF THE WITHERS AND INJECTIONS OF AMBRINE [*A. Videlier and Abraham, Army Veterinarians*].—A horse, aged nine years, belonging to a physician, had a cyst on the withers. It is punctured with the red iron and treated with a solution of peroxide and red ointment diluted in oil. After two week the artificial fistula is closed but the cyst remains. New puncture. The discharge becomes suppurating and remains persisting. The fistula does not heal. Other treatments were also resorted to without benefit, and before performing the operation of curetting the cavity of the cyst, it was decided to try injections of ambrane at 50 per cent. After eight injections the suppuration stopped and three days after the wound was completely healed and remained so. The horse resumed his work then without having any more trouble.—(*Rec. de Medec. Veter.*)

ABSCESS OF THE WITHERS CURED WITH AMBRINE INJECTIONS [*Same author*].—Six years of age, this mare had an abscess of the withers which burst and was treated with antiseptic injections. The cavity of the abscess filled up again and soon remained a fistula oozing thin serous pus. The mare was thrown, the fistulous tract freely incised and sublimate powder dressing is applied. This treatment had to be stopped as the animal presented some manifestations of mercurialism. Iodoform was then used. The cicatrization seemed then to progress; but a fistula was again the conclusion. It remained narrow and the injections had great difficulty to be inserted. After a few days the abscess had filled again. Opened with a free incision, a probe was introduced and the apex of the vertebral spinous processes were felt rough and necrotic. For two weeks the abscess was then treated first by an injection of pure peroxide followed by others half strength. A dressing of biniodide of mercury was also applied. All of these treatments proved of no avail and finally an injection of liquefied ambrane was made. The next day suppuration had changed in nature. It was thick and quite abundant. After the tenth injection the fistula was nearly closed. After three days more cicatrization was complete.—(*Ibidem.*)

FRACTURE OF THE RIBS—PNEUMOTHORAX AND HEMOTHORAX [*Mr. Guillemain, Army Veterinarian*].—A six-year-old mare suddenly, while at work, blows hard and shows a swelling of the left costal region. At rest, the respiration is accelerated dyspnœic. The mucous membranes are pale. Temperature is normal. Back of the left shoulder the thoracic wall at its lower part has a swelling, quite large, very painful and crepitating. There is a fracture with displacement of the sixth and seventh ribs. Percussion gives a tympanitic sound on a level with the gaseous crepitation, and complete dullness below. Auscultation shows diminution of respiratory murmur, and few dry râles of crepitation. The pulse is weak and internal hemorrhage is feared. The fracture is complicated with pneumothorax and hemothorax. A broad sinapism of mustard is applied and the apparatus left in place for two weeks so as to limit the motions of the ribs. After one week there is improvement. The animal is left in liberty in his box; but another hemorrhage has taken place as the temperature runs up to 40°. New local revulsion, sinapism and blister. The animal is taken with strangles and treated with three injections of 2 c. c. of oil of turpentine in the chest. The abscesses that followed this aborted the disease. The animal recovered with having only a slight costal deformity.—(*Rev. Veter. Milit.*)

TUBERCULOSIS OF CASTRATION IN SWINE [*P. Chaussé, San. Insp.*].—Tuberculosis by introduction through wounds of castration has been mentioned quite frequently in Germany. In France no observation seems to have been recorded. The author had doubt as to the reality of the infection in swine, when two cases were brought to his attention. In a seven-months-old pig which was in good condition, there was found subcutaneous caseo-calcareous nodules of the left inguinal region with appearance of a tuberculous state in the corresponding inguinal glands. The iliac and sublumbar glands were also diseased. Other glands through the organism were healthy.

In a second case, another animal of the same age presented in the perineum a bilobulated lesion formed by an agglomeration of caseo-calcareous tubercles, developed on a level with the wound of castration of the left side, around which were several subcutaneous tubercles in the adipose tissue. In the atrophied vaginal sheath there were inguinal glands forming a big mass, also caseo-calcareous, which existed on the right side. There were pul-

monary, hepatic, splenic, renal and bony lesions. In fact, an extensive generalized infection. The author thinks that these two infections were of bovine origin.—(*Rec. de Medec. Veter.*)

TWO CASES OF VAGINAL FIBROMAS IN COWS [*Mr. Lamouroux*].—In a first case the cow had just had her calf and after a prolapsus of the vagina. This was reduced without difficulty, and in exploring the vagina the hand of the writer came in contact with a hard mass as big as a child's head and located in the thickness of the mucous membrane. It was gently pulled out of the cavity and punctured to establish its nature. It was an en-cysted fibroma, which was enucleated after rupture of its peduncle. It weighed 1 kilogramme 150 grammes.

In the second case the cow had fortunately calved alone, but after her normal delivery there was an enormous mass hanging below the vulva. The animal seemed in perfect condition and unmindful of the trouble. The mass was smooth, reddish, dense in structure and very hard. It was a fibroma with a fairly long peduncle, round which a piece of strong twine was tightly applied. The mass was then cut off. It weighed 6 kilogrammes 700 grammes. The case might have been one of maternal dystokia if the tumor had interfered with the calving.—(*Ibidem.*)

ITALIAN REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

TWO CASES OF VAGINAL SARCOMAS IN SLUTS [*Doct. Luigi Menicagli*].—Case 1.—Five-year-old slut has a tumor as big as a hen's egg, protruding from the vulva. Stranguria and hematuria are observed. Exploration with the finger shows that there are numerous other tumors of various sizes and that the urethral opening is also surrounded with small growths about the size of little nuts. Combining the exploration with abdominal manipulations it is ascertained that the trouble is located within the vagina only and that the sarcoma is limited to that cavity. The treatment followed was an operation in which after careful disinfection, the animal being anaesthetized, was laid on her back with hind paws kept apart and spreaders applied on the lips of the vulva. The principal growth was secured with strong forceps, drawn out and amputated. A second growth ovoid and

also rather big was again removed, as well as smaller ones. After when those surrounding the urethral opening had been cut off, the urethra was dissected out and transplanted on a surface of the mucous membrane free from neoplastic infection. The operation was completed by free irrigation with lysoformed water. Catheter had to be used for three days only. Cicatrization was completed by first intention in a few days, when the dog went home.

Case 2.—This occurred in a setter slut, aged 14, which had protruding between the lips of the vulva, a tumor as big as a pigeon's egg, of dark wine color, ulcerated and giving escape to a very offensive discharge. This condition was reported by the owner as of recent date. Vaginal exploration showed that the tumor had a small peduncle and had the aspect of a fibrous polypus, although the microscopic examination indicated its sarcomatous nature. The removal of the growth was done with the galvanic cautery and the operation proved even simpler than the preceding. Twelve days after the bitch was found dead without having shown any bad effects from the interference. Death was caused by cardiac insufficiency. But besides that lesion, tumors were found at the autopsy in the posterior mammae, the abdominal cavity opposite the quadrifurcation of the aorta between the external and internal iliac. Nothing abnormal in the genital organs nor in the peritoneum.—(*Il. Nuovo Ercolani.*)

CONTRIBUTION TO THE STUDY OF TUMORS IN THE TESTICLES OF CRYPTORCHIDS IN HORSES [P. Ghisleni].—The author records a case of bilateral cryptorchidism in a seventeen-year-old horse, interesting because both testicles were the seat of neoplasms, a condition never recorded in horses before. A horse supposed to have been castrated had intermittent colics for three days, and the presence of a painful swelling of the right scrotal region had made him suspect of having scrotal inguinal hernia. When operated, it was found that the scrotal swelling was due to a tumor of the testicle partly engaged in the inguinal canal. The tumor was removed with the ecraseur, but the animal died during the night, with interperitoneal hemorrhage. The other testicle was found in the sub-lumbar region, forming a large tumor. The right testicle weighed 3 kilos 800 grammes, and the left 10. The author classes these tumors in the group of orchidomas, established by Kitt for such neoplasms.—(*Clin. Veter. and R. G.*)

A COW-SHED INFECTED WITH ACTINOMYCOSIS [*Doct. Arnaldo Fumagalli*].—The author was called to give his opinion as to the quality of the meat of a calf that had died suddenly. The anatomo-pathological lesions were those of pneumonia with little yellowish nodules spread in the pulmonary parenchyma. The meat was not used for marketing. A month after another visit was required for another calf which was very sick with pulmonary troubles. The animal being likely to die, he was killed and presented lesions similar to the preceding. A third case occurred with the same result and the lesions of the lungs being then examined with the microscope, proved to be those of actinomycosis. The stable from where these calves came was infected and its disinfection was carried out. Several weeks later four animals from the same place were castrated. The operation being carried out in the usual way. Of these two made a perfect recovery but the others developed an actinomycotic funiculitis, which required another surgical interference. The straw used for bedding of these animals was infected, and while it had given rise to pulmonary disease in some animals by the inspiration of the specific elements, it promoted the infection of the testicular wound in the others.—(*Clinic Veterin.*)

INTRA-MAMMARY HERNIA IN A COW [*Adolfo Luciani*].—Called for a ten-year-old cow, in good condition, which presented in the region of the udder, principally on the left side, an oedematous swelling. The cow had worked plowing up to two or three days ago, when the tumor had been noticed, and it was found enlarging every day. It was rather hard and without point of fluctuation. Suspecting the case to be one of single mastitis, applications of belladonna ointment and flaxseed meal poultices were prescribed. After three or four days, there was no change and the tumor remained in the same condition. After carrying the treatment a few days longer, fluctuation was finally detected in the posterior part of the mammae. An exploring trocar being introduced, instead of pus there escaped a fluid carrying fecal substances, and when the puncture was enlarged with a stroke of the bistoury, a free escape of fecal fluid took place. The animal was immediately sent to the butcher. At the autopsy was found a fold of the small intestine, located between the two quarters of the left mammae. It had made its way through an opening near the linea alba, involving all the abdominal muscles. The portions

of the udder were already undergoing gangrene. It is probable that the accident was the result of a blow given with the horns of another cow.—(*Il. Nuovo Ercolani.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D., Buffalo, N. Y.

THE ETIOLOGY OF THE NODULES IN THE INTESTINES OF CATTLE [Marotel].—In a previous article Marotel stated that the larvæ which are found in the nodules in the intestines of cattle belong to the species *Oesophagostomum*. However, up to the present time he has advanced no direct proof to support his claim.

Accidentally, Marotel discovered in the intestines of a cow nodules which were about four months old. He hoped to find in this animal larvæ which were just undergoing a metamorphosis. Marotel made a minute examination of this parasite which led him to the following conclusions:

1. The metamorphosis of the parasite does not take place in the nodule, but in the lumen of the intestine.
2. This change occurs 4 to 5 months after the beginning of the disease, about the months April to June, when the worms are eight months old and 4 to 5 mm. in length.

3. The parasite belongs to the *Oesophagostomum radiatum* and is no *uncinaria*.

4. In the nodules the larvæ are found in the following stages of development: (a) As strongylus-like larvæ 500 to 1,000 microns long with a small, hornless mouth. (b) As ankylostomum-like larvæ 1,000 to 2,500 microns long with an elliptical indented mouth capsule. (c) As *œsophagostomum*-like larvæ 2,500 to 3,200 microns long with an elliptical mouth capsule and a cervico-ventral cuticular ring. The invasion of the parasites in the pastures occurs in August and September. They penetrate the intestinal wall, remain there from 6 to 7 months and produce the pea-shaped nodes and go through the three larval stages just described. During the months of March and April they escape into the lumen of the intestine; then they become sexually ripe and in May and June develop into typical *œsophagostomum*. In July and August they attain a length of from 15 to 20 mm. After copulation they lay their eggs; the latter being discharged with the feces, infect the pastures.—(*Deutsche Tierärztliche Wochenschrift*, No. 23, 1909.)

A NEW METHOD OF PRODUCING LOCAL ANÆSTHESIA.—At a meeting of the Berlin Medical Society, Prof. Bier described a new method of producing local anaesthesia, as a result of which major operations can be performed painlessly on the arms and legs. The procedure is as follows: Eucain is injected into the larger veins, an Esmarch's bandage being applied above and below the seat of operation. Bier had employed this method of producing venous anaesthesia in more than 100 cases, each attended with success. As a matter of fact it should supersede lumbar anaesthesia. If this method proved itself practicable in veterinary surgery, certain operations could be more readily performed.—(*Deutsche Tierärztliche Wochenschrift*, No. 12, 1910.)

THE TREATMENT OF LUNG-WORM DISEASE.—In the treatment of lung-worm disease we ought to have good results from intratracheal injections of a 1 per cent. solution of carbolic acid or potassium picronitricum. District Veterinarian Arndt of Gifhorn recommends intratracheal injections of a mixture of olive oil and oil of turpentine aa 100 grammes; creolin, 5 grammes. According to the reports of other practitioners the employment of cresotovaso-liniment internally has been very effective. A tea-spoonful 4 to 5 times daily (20 per cent. for calves, 50 per cent. for young stock) given in combination with milk or gruel.—(*Berliner Tierärztliche Wochenschrift*, No. 10, 1910.)

INVESTIGATIONS CONCERNING ASPIRIN, NOVASPIRIN, AND ASPIROPHEN [F. Block, *Westercappeln*].—Dr. Block compiles the results of his investigations in the following brief sentences:

1. The modern salicylic acid derivatives, aspirin and novaspirin, are well borne by horses and dogs, in proper doses.
2. Their action upon dogs in doses of 0.7 grm. pro kg. body weight is toxic. Double doses of the same are fatal. Single doses of 0.4 grm. pro kg. body weight are not injurious to health. For horses single doses of 300 grms. are toxic.
3. Aspirophen contains free salicylic acid and its action is less efficacious than aspirin and novaspirin. For dogs, 0.4 grm. pro kg. body weight is poisonous; 0.7 grm. pro kg. body weight is fatal; 300 grms. given to the horse sickens the animal. Therefore the use of this agent in veterinary practice is not recommended.

4. The symptoms of intoxication induced by aspirin, novaspirin and aspirophen are similar to those of salicylic acid poisoning.

5. The elimination of salicylic in the urine after the administration of aspirin and novaspirin begins in about half an hour and disappears at the end of the third day. Aspirophen is completely eliminated after the second day.

6. The therapeutic dose of aspirin and novaspirin for the dog is 0.5 to 3.0 grms.; for the horse, 25 to 100 grms.—(*Deutsche Tierärztliche Wochenschrift*, No. 9, 1910.)

"I WISH I could see why I don't do better with my cows," said a discouraged farmer to one who was more prosperous.

"Well," said the other, "maybe if you would let a little more good dairy light shine into your mind, you would see."—*Hoard's Dairyman*.

LITTLE MURIEL flew into the house, flushed and breathless. "Oh, mother," she cried, "don't scold me for being late to tea, for I've had such a disappointment! A horse fell down and they said that they were going to send for a horse doctor, so of course I had to stay. And after I'd waited and waited he came, and oh, mother, what do you think? It wasn't a horse doctor at all. It was only a man!"—*Everybody's Magazine*.

FOURTEEN of the principal horse fountains in the City of Boston have each been recently equipped with the "Simmons" apparatus for constantly and quickly removing automatically all surface scum, impure and foreign substances from the water so that the transmission of glanders and other contagious diseases from one drinking animal to another may be practically eliminated. It is an exceedingly clever invention.—*Our Dumb Animals*.

DR. R. C. LONGFELLOW has been notified by Dr. William C. Woodward, secretary at Washington, that he was elected at the Milwaukee meeting to membership in the laboratory section of the American Public Health Association. This section is composed of the best known pathologists, bacteriologists and laboratory workers in America, Canada, Mexico and Cuba. The election of Dr. Longfellow to this body of scientific men is in recognition of his work in this city.—*Clipping*.

SOCIETY MEETINGS.

EXTRACT FROM FOURTEENTH ANNUAL MEETING OF THE UNITED STATES LIVE STOCK SANITARY ASSOCIATION.

Held at the Grand Pacific Hotel, Chicago, Ill., December 5, 6, and 7, 1910. President, C. E. Cotton.

ADDRESS OF WELCOME BY J. H. MOORE, PRESIDENT, CHICAGO LIVE STOCK EXCHANGE.

The removal of tuberculosis from the State of Illinois, which threatens not only live stock purchasers, but the consumers of milk and beef. He spoke of the need of legislation which would prohibit any state from making Illinois a dumping ground for diseased cattle. He also spoke of the tuberculin test, as to whether or not it was a reliable guide for determining whether or not an animal was affected with tuberculosis.

RESPONSE BY DR. MOHLER.

Dr. Mohler stated that this country had five billion dollars invested in the various kinds of domesticated animals, which, on every side, were threatened with pestilence and disease, and stated that two hundred millions of these were lost annually from animal disease.

ADDRESS BY PRESIDENT C. E. COTTON, V.M.D.

By the change in our constitution at the last annual meeting any person engaged in live stock sanitary work for federal, state, territorial, county or municipal governments, and any other person interested in live stock sanitation is eligible and may be elected to active membership. This should make this association the leading and largest organization of its kind in the world, and we must not forget our responsibilities. We should be the advisory body for all federal, state, county and municipal legislation for the control of contagious diseases of live stock and we should use our influence to have such legislation in harmony and not conflicting.

Our association is composed of laymen and stockmen interested in the welfare of our live stock industry, as well as scientific men engaged in investigation and control of contagious diseases. These laymen are of the greatest value in the accomplishment of our work to educate the public. At our meetings we learn of the study of the various diseases and the practical methods of controlling and eradicating them, and we return to our homes prepared and encouraged to educate the public in our localities and to work for the proper legislation to control and stamp out contagious diseases.

The conservation of the live stock industry of the country, principally from the standpoint of the money value which it represents, and also from the standpoint of human health, places the work of the live stock sanitarian equal to, if not of greater importance than, any other branch of government control.

He also spoke about the cattle tick and its eradication, the work that is being undertaken with hog cholera in the various states and the eradication of the sheep scab in the western states which is progressing rapidly. Also the control of lip and leg disease in the sheep in the West. One of the greatest problems is controlling glanders, rabies and tuberculosis.

He also commented on the International Commission on Bovine Tuberculosis. Also regarding the laws of the various states and hoped that they would soon be of a uniform character and that this association would lend their aid in bringing this about.

The Secretary announced that thirty-four states had representatives present.

The next paper was that of Dr. A. D. Melvin, Chief of the Bureau, who read a paper entitled, "Federal and State Co-operation in Live Stock Sanitary Control." The doctor suggested a more systematic co-operation with the Federal government and the different state authorities. He deplored the fact that the United States did not have the same as European countries, a system for reporting the presence and the extent of contagious diseases of live stock. He thought by thorough co-operation with the various live stock boards that something tangible could be worked out, which would be of great importance to the United States. He stated that it was desirous to secure fuller information on the following diseases: Hog cholera, anthrax, glanders, tuberculosis, contagious abortion, scabies, necrobacillosis, contagious lymphangitis and rabies. In

his paper he gave an outline of a plan that he had in mind, and which should be carefully considered by all sanitary boards.

The next was a paper by Dr. R. P. Steddom on "Tick Eradication in the South." The doctor went into the history of this work and gave in detail the progress made in the eradication of this disease in the South, and also suggested some new regulations. His paper gave a very hopeful outlook for the eradication of this disease.

Dr. Steddom's and Dr. Melvin's papers were then discussed by various members, especially the members of the South, who gave their version as to the greatest obstacles in the way of more successful work. The principal ones discussing this were: Dr. Keane, Dr. Powers, Mr. Bryan, Dr. Lewis, Peter Bahnsen, Dr. Nighbert and E. B. Spiller, Dr. Forbes, Dr. M. P. Anderson, Dr. T. M. Owen, Dr. J. A. Kiernan, Dr. L. J. Allen, Dr. Ellenberger, Mr. P. S. Haner, Dr. Reynolds, Dr. Ward, Dr. Crewe and Dr. Leech.

The next paper was that of Dr. Luckey, and was of much importance to the cattle owners for it described a new parasite (*Oesophagostoma Inflatum*). This parasite was found during the wet season on low, wet ground and caused a considerable loss in a number of herds, and the doctor described the parasite, also the symptoms in a very clear manner. He also gave his line of treatment and the prevention of this disease. This was discussed by Doctors Ranson, of the Bureau of Animal Industry; Juckniess, of Nebraska, and Moore, of New York.

The next was that of a report by Dr. Niles on "Hog Cholera Investigation." The doctor gave a report of the work of the Bureau of Animal Industry and stated what methods they were pursuing and the experiments they were conducting to perfect the methods now in vogue. He gave a very great deal of experimental data which was of great importance to the members present.

This was followed by a very interesting paper by Dr. Eichhorn, who had been abroad and while there, visited the laboratories of Austria-Hungary. He described in detail the workings of this large laboratory, stating the number of animals that they had under treatment and the number of acres that it required. This laboratory has produced, during 1910, monthly, about 260 litres of serum. The institution aims to have always on hand a supply of serum to comply with all requests. He stated that they had treated approximately 400,000 animals and described in

detail the method of their manufacture, how the material was sent out to the farmer and what they charged for it.

The next paper was that of Dr. Schoenleber, entitled, "Some Necessary Precautions in Anti-Hog Cholera Field Work." He gave a resume of the work done in Kansas and stated that they had treated approximately 20,000 head of hogs.

This was followed by Dr. Fisher, of Ohio, who reported on the serum work in his state, giving in detail the work done there; that they had sent out about 60,000 20-c. c. doses, used 312 hyperimmunization hogs. He also described their method of sending out their serum and the rules and regulations governing the same.

This was followed by Dr. Reynolds, of Minnesota, who gave a report of hog cholera work in the State of Minnesota, describing their method and the rules and regulations under which they worked in sending out this serum.

Following Dr. Reynolds, Dr. Peters reported for the State of Illinois, stating that 22,000 head of hogs were treated during the year. The tabulated reports of 15,000; 31 per cent. of the 15,000 were sick, and 79 per cent. of the 15,000 were saved.

This was followed by Dr. Marshall, of Wisconsin, who also reported for the State of Michigan. He was followed by Dr. Craig, of Indiana, and Dr. Moore, of New York. In conclusion Dr. Dorset, the gentleman who originated the method, then said a few words. He deplored the fact that the serum was employed largely in diseased hogs, stating that this would be expensive and continue to be so, as long as this method was practiced; and stated that there should be some well-defined method made in co-operation to secure the final reduction of this disease. He suggested that the various states adopt the plan recommended by Dr. Melvin in his paper before this meeting. He believed that some method could be worked out so that in a short time this disease could be eradicated.

Dr. Hughes read a very interesting paper, entitled, "The Veterinarian as a Factor in Sanitary Control Work." The doctor gave a history of sanitary control work throughout the world and very ably brought forth the influence of sanitary control work and how sanitary work had come about and the results accomplished since the inauguration of sanitary work by the various governments throughout the world. He enumerated the number of diseases that have been practically stamped out

or held in check thereby. He also showed up the defective side of the work and made suggestions where this could be materially strengthened. This paper brought out a liberal discussion which was participated in by many.

The next paper was that of O. E. Dyson on "A Reasonable Plan for the Control of Bovine Tuberculosis." This paper treated on the fundamental principles involved in the eradication or control of Bovine Tuberculosis. Under specific recommendations, he said in order to encourage a larger production of healthy cattle throughout the United States, laws should be enacted in every state requiring that anyone having knowledge of the existence of this disease in cattle or hogs should notify the state representatives. He also suggested that provisions be made under quarantine regulations to permit breeders to sell or purchase cattle which have reacted to the tuberculin test and are properly branded. No compensation should be paid to the owners of animals slaughtered until said owner had conformed to every regulation supplied by state or Federal authority. The sale, distribution or use of tuberculin for testing cattle should be prohibited, except under state and Federal laws, providing for its official use. The doctor had herds classed under A, B and C.

Ex-Governor Hoard's paper on "Tuberculosis Control from a Layman's Standpoint." He gave his first experience with the use of tuberculin and what it done for him. At the first test he discovered four animals to be affected. These were killed and from then on he tested regularly and maintained a clean herd. He does not take any animals to his herd that have not been thoroughly tested and quarantined for months. He says, "to this latter I owe a large part of my exemption from this disease." He says, "every man should have pride and patriotism enough to wish to maintain a healthy herd. In my opinion, every farmer should test his cattle once a year at least and take none to his herd until he is absolutely certain that they are free from all contagious diseases."

The following paper was given by Dr. Ravenel, on "Control of Bovine Tuberculosis by Means of Vaccination." Dr. Ravenel gave a very interesting paper. He gave the history of bovine vaccination and the commission who were responsible for the work as early as 1892, and brought the work of vaccination against this disease to date. He quoted all the investigators that had taken part in vaccination against tuberculosis and also gave a detailed report of the methods pursued and the results

obtained. He was hopeful that a vaccine would be found that could be used to immunize cattle against tuberculosis and quoted investigators that are at work.

The following paper was presented by Dr. Ward, of Minnesota: "Extension of State Control of Tuberculosis." The doctor recommended that, as pure bred cattle are frequently tuberculous (he said, in fact, very few of the fashionable breeds were free from the disease), therefore, some measure should be put in force to eradicate this disease among them; before enforcing the testing of pure bred herds, a legislative act is necessary. He stated that opposition on the part of the breeders to such a measure could not be very pronounced. He stated, "having cleaned the pure bred herds, the next great source of danger was the creameries." He recommended the pasteurization of all creamery by-products. He says the greatest problem of all city ordinances lies in protecting the dairymen from buying diseased animals. Many dairy cows are shipped interstate to stockyards situated at points like Chicago, Omaha, Sioux City and St. Paul, which are never inspected for the reason that they are shipped for supposed slaughter, but on arrival at the yards many of these are sold to dairymen without inspection. He recommends the compulsory notification of the existence of tuberculosis; and another feature in extending control work, which has frequently been overlooked, is the disinfection of premises in which diseased animals have been housed. He is heartily in favor of uniform certificates of health, which could be readily identified by all railroad agents. To prevent shippers and veterinarians from supplying themselves with blank certificates, he would suggest a form be adopted similar to the B. A. I. 24-B, having printed thereon, "Permission of the United States Department of Agriculture." Sanitary authorities could then issue blank forms to reputable veterinarians as required.

This was followed by a general discussion by Drs. Reynolds, DeVine, Luckey, Moore, Leach, Behnsen, Craig, Melvin and Bryan.

Following this was Dr. Fraser's paper on, "Sanitary Milk from the Producer's Standpoint." He stated that milk was entirely an infant food and about sixty-five per cent. of all babies are brought up on this food and therefore the public may rightly demand sanitary milk. He stated that in some places it was almost impossible to secure in the open market a good milk product. He suggested to bring about an improvement in these con-

ditions, the producers and handlers of the product should be educated to the importance that if the milk is not kept clean that bacteria will enter and thereby cause death to human beings. He deplored that the true food value of milk was not appreciated and that it was not more freely used than it is. He drew attention to the importance of cleanliness in the production of milk, and that if the product was not kept clean a large amount of sickness and suffering was caused therefrom. He stated that high prices do not necessarily mean clean milk. Unfortunately the general public is not earnestly interested in the milk problem further than the price is concerned.

The next paper was that of Claude D. Morris, V. S., on, "Sanitary Handling of Commercial Milk." He described the up-to-date method of handling milk on the farm, how it is taken from the cow and kept in a clean condition until it is delivered, either to the factory, or to the consumer. He described practical methods for the country bottling factory system in conformity with the state and city authorities in connection with the market production; also, to have his herd clean from diseased animals. He pleaded for the better conditions on the farm, in correcting the errors that are very often found there.

The next paper was by Dr. Black on "Sanitary Milk"; which would be practically free from diseases, such as typhoid germs, scarlet fever and diphtheria. He gave in detail the work of the commission and what they were doing for the milk consumers and the producers of the State of Illinois that were supplying milk to the City of Chicago.

Dr. Evans, City Health Commissioner of the City of Chicago, then spoke on the subject of clean milk. He pleaded for clean milk and gave in detail the work that his laboratories were doing in Chicago, for the milk men that are furnishing milk to the City of Chicago, and how they had reduced the death rate among babies thereby, and also other sickness in proportion. He described at length the manner in which the City Health Department was handling this very important subject. This was discussed by Drs. Van Derslice, Lackner, Moore, Clark, Luckey, Morris, Brand, Dyson, Black and Morgan.

Dr. Mohler described the Russian diagnostic test for glanders. He had some specimens presented and demonstrated the method before the association, which was intensely interesting to all those present. He stated that this method was reported as very accurate and very much easier in its application

and hoped that the experiments would continue as favorably as they have been the last few months, and he thought that if they would continue to be so, that it would be universally adopted as a diagnostic agent for glanders.

The next was Mr. W. R. Manss. His subject was, "Reasonable Sanitary Measures in Live Stock Transportation." Mr. Manss related the method of handling live stock and the difficulties that arise in transporting the same. He cited the demands that are placed on the railroad companies by the shippers and urged for hearty co-operation between the state and Federal authorities. Also made an eloquent plea for a uniform certificate of health that would be recognized by all authorities and that could be easily interpreted and would not require any legal talent, so that when a shipment started from one end of the United States with a certificate, that that certificate would be honored throughout.

Papers by Dr. Mack and Dr. Kinsley related to the same subject, "Equino Anemia." They brought out the fact that this disease in horses is wide-spread, and that it had great need of investigation, especially along the lines of a curative agency. The fact was brought out in the discussion that horses affected with this disease and apparently recovered, upon examination eighteen months afterwards were found to be still affected with the disease. The discussion further brought out the fact that all the men interested in experimenting with this disease have not been able to transmit this disease from one animal to another by contact, by allowing a healthy animal to be placed in the same stall with the diseased animal for a very long period, of many months, without any results. Also, the thought of it being produced by some insect, they thought was very remote.

The next paper read was the report of the Committee on Basic Law.* This committee reported on uniform laws for the various states regulating sanitary boards and live stock commissions.

One of the most important resolutions passed was that of the Committee on Uniform Health Certificates:

"This Committee recommends to the United States Live Stock Sanitary Association, that it request the B. A. I. to formulate a uniform certificate for the interstate shipment of live stock destined to states requiring inspection, and in the case of cattle for milk production and breeding purposes, destined to

* Published on page 573, this issue of the REVIEW.

states requiring the tuberculin test; such certificate to be accompanied by a record of said test, issued by a qualified veterinarian regularly registered with the Bureau of Animal Industry." R. W. HICKMAN, S. H. WARD, J. F. DEVINE, CHARLES KEANE, PETER F. BAHNSEN.

REPORT OF COMMITTEE ON TICK ERADICATION, UNITED STATES
LIVE STOCK SANITARY ASSOCIATION.

CHICAGO, ILL., December 7, 1910.

Your committee on Tick Eradication recommends the following territory situated within the quarantine area, be released from quarantine.

Mississippi.—Release from quarantine Marshall County north and west of the Illinois Central Railroad. Benton County north of Tippah Creek.

Tennessee.—Release from quarantine the balance of Madison County, Overton County, balance of Fentress County, balance of Lincoln County, and that portion of Polk County north of Hiawassow River.

South Carolina.—Release from quarantine Union and Laurens Counties.

Virginia.—That Fluvanna County and Chesterfield County be released from provisional quarantine.

North Carolina.—Release the following counties: Stanley, Randolph, Wake, Chatan, Montgomery and Franklin.

Texas.—Release the following area from quarantine: Cottle County, and those parts of Hardeman County north of the Fort Worth and Denver City Railway, Mitchell and Howard Counties north of the T. P. Ry.

Oklahoma.—That the following area be released from quarantine: That part of Jackson County now in the blue, that portion of Kiowa County lying north of the line between townships Four and Five North, and that part of Township Four, North, Ranges Nineteen and Twenty, West, that portion of Caddo County now in the blue, that portion of Pottawattamie County included in Townships Ten and Eleven North, Two East, that portion of Lincoln County now in the blue and that portion of Pawnee County included in the following named townships—Townships Twenty-one and Twenty-two North, Five East, Twenty-one and Twenty-two North, Four East, Twenty-two North, Three East, and those portions of Twenty-three North,

Three East, Twenty-three North, Four East, Twenty-three and Twenty-four North, Five East.

Alabama.—No recommendation. *Missouri*.—No recommendation. *Arkansas*.—No recommendation. *Louisiana*.—No recommendation. *California*.—No recommendation.

Your Committee on Tick Eradication by resolution, also recommends as follows:

RESOLVED, That there be no open season for the movements of southern cattle this year, and that no additional territory be added to the provisionally quarantined area. JAMES LEWIS, Chairman; CHARLES KEANE, Secretary; G. T. BRYAN, E. R. FORBES, M. RAY POWERS, W. P. ELLENBERGER.

The election of officers for the ensuing year, was as follows: For President, Dr. J. F. DeVine, of Albany, N. Y.

First Vice-President, F. A. Walker, of Massachusetts.

Second Vice-President, Dr. Charles Keane, of Sacramento,

Cal.

Third Vice-President, G. T. Bryan, of Guthrie, Okla.

Fourth Vice-President, Dr. W. F. Crewe, of Devil's Lake, N. D.

Fifth Vice-President, Dr. M. H. Reynolds, of St. Paul, Minn. Secretary, J. J. Ferguson, of Chicago, Ill.

After a vote of thanks to President Cotton for the efficient and capable manner in which he had conducted the meeting, the Convention adjourned *sine die*. The following states sent in reports: Massachusetts, Arizona, Wisconsin, South Carolina, North Dakota, Delaware, North Carolina, Oregon and Louisiana.

J. J. FERGUSON, Secretary.

REPORT OF PRESIDENT JOLY, MAINE VETERINARY MEDICAL ASSOCIATION.

To Dr. E. P. FISH, Secretary, Board of Health, Waterville, Me., September 22, 1910.

DEAR SIR—I hereby submit my report of the work done in relation to the milk supply for the city of Waterville.

On account of so many cases of tuberculosis in the city and the efforts being made daily by the Central Maine Association for the Relief and Control of Tuberculosis, your board felt its duty to ascertain the quality of our milk supply; so according

to a vote of the Waterville Board of Health, I was authorized to interview the milk producers and offer to them the free testing of their herds.

I have tested with tuberculin fifty-four herds, 618 head of cattle in all, and found twenty-five tuberculous animals.

As the milk is all mixed together at the dairy, one tuberculous cow in a herd will contaminate the whole output of milk of the entire herd.

These twenty-five diseased cows were found in nineteen herds, containing 248 cows. One cow will supply milk to about twenty-five persons during the year; so 248 cows can furnish milk to 6,000 persons. Consequently, half the population of Waterville at some time during the last year have drunk tuberculous milk.

In connection with the work, I was given the right by the Cattle Commission, to condemn tuberculous animals and to appraise the same, the owner to receive full appraisal, limited to \$50, and I also had the supervision of the whitewashing and the disinfecting of infected stables, charging the expenses to the state.

These condemned animals were shipped to E. W. Penley's abattoir, in Auburn, where a post-mortem was held by Dr. W. W. Groff, United States Government Inspector, from the Bureau of Animal Industry, and a report made to the Maine Cattle Commission. The carcasses went to the rendering tank.

I have issued fifty-four certificates of clean bill of health to the owners of the herds which I have tested.

Every milk producer has complied with the request of the Board of Health, with the exception of six persons.

We have upon the market a blended milk, which is no more desirable than tuberculous milk. During the summer over 1,000 gallons of such milk have been sold in the city.

Blended milk is composed of nine parts, in volume, of pasteurized skimmed milk, and one part of pasteurized cream; by being mixed thoroughly it will test 4 4/10 per cent. of butterfat. It is not unlawful to sell blended milk, but it should be labeled.

Pasteurized milk should not be kept over twenty-four hours, even if it seems to be sweet; for it will become putrid before it sours.

In order to complete the work, and assure the citizens of our city that the milk supply is free from diseased animals, also

free from other sources of danger, the Board of Health must adopt rules and regulations in regard to the sale of milk. It is up to the Board of Health to act accordingly. In closing, I wish to state that these fifty-four milk producers who have had their herds tested have been pleased to co-operate in the work, both by showing me their confidence and treating me with courtesy.

ALPHA PSI FRATERNITY—GAMMA CHAPTER.

Alpha Psi fraternity, a national veterinary organization, conducted its second biennial convention in Chicago November 25th and 26th, 1910, the six chapters being represented.

Alpha Chapter, of Ohio State University, sent H. A. Greaves; Beta, of Cornell, was represented by E. J. Merchant; Gamma, of Chicago Veterinary College, by its president, R. S. Hamilton; Delta, of Kansas City Veterinary College, by E. H. Salisbury; Epsilon, of the University of Pennsylvania, by H. J. Werntz; and Zeta, of Colorado State College, by J. D. Knapp. The national officers were on hand with the delegates, and for two days all combined business with pleasure and made the convention a memorable one.

Gamma Chapter showed royal hospitality to all by providing a program of entertainment for three evenings. On Thursday night there was a smoker in the rooms of the chapter, which was attended by the delegates and national officers, as well as by all the chapter members, and their honorary members, including Drs. L. A. and Edward Merrillat, C. A. White, D. A. Hughes and J. F. Ryan. Professional talent entertained, and during the evening the visiting fraternity men had the opportunity to meet the Chicago members. On Friday evening all visited the International Horse Show, occupying seats which gave all a splendid opportunity to view the stunts on the tanbark. The feature of the program was the banquet on Saturday evening tendered to the delegates and national officers by Gamma Chapter in the Chicago room of the Great Northern Hotel. Seventy covers were laid, the banquet being followed by brief talks by the delegates, National President A. F. Schalk and honorary members of Gamma Chapter, as well as two prominent guests, President Joseph E. Hughes and Dean A. H. Baker, of the Chicago Veterinary College, who expressed their pleasure in being present. There were remarks by George L. Drury, who welcomed

all; Drs. E. L. Quitman, Edward Merrillat, J. F. Ryan, D. A. Hughes, A. H. Baker and Joseph Hughes. There were many complimentary expressions from the above speakers which were of much gratification to Gamma Chapter men, as well as to the visiting delegates and officers. Dr. Schalk spoke for the fraternity at large. L. J. Rielly was toastmaster.

The next convention of the fraternity will take place in Philadelphia two years hence. These officers were elected to serve until then: President, Dr. Harry E. Kingman, Colorado State Veterinary College; Vice-President, Dr. Charles J. Miller, Cornell University; Secretary, Dr. H. Preston Hoskins, University of Pennsylvania, and Treasurer, A. M. Janson, Ohio State University.

GEO. L. DRURY, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular meeting of this association was held in the lecture room of the New York American Veterinary College, 141 West Fifty-fourth street, on Wednesday evening, December 7, with the president, Dr. E. B. Askerman, presiding.

Dr. R. W. Ellis acted as secretary pro tem awaiting the arrival of the regular secretary.

Dr. Mangan, chairman of the Prosecuting Committee, reported, and his report was discussed by Drs. McKinney, Darke and Kingston.

The committee dealing with the matter of the proposed establishment of a Veterinary Bureau in connection with the Department of Health, reported progress.

Dr. Kingston reported a case of a horse running away and badly injuring the orbital fossa and side of the face and head. So much skin was destroyed that he feared the part would not be covered except by sear tissue. He asked for opinions regarding the feasibility of grafting skin onto the denuded surface. None of the members present had had any experience in skin-grafting on the horse.

Among the queries in the question box was the following: "Is a thrombus necessarily a foreign body?" This was discussed by Drs. Ellis, Clayton and Mangan and others, and the consensus of opinion was that the thrombus is a foreign body.

The election of officers for the ensuing year followed, with these results: President, W. Reid Blair; vice-president, R. H. Kingston; secretary and treasurer, R. S. MacKellar.

Dr. J. E. Crawford will present a paper at the January meeting on the "Treatment of Open Joints"; and Dr. H. Stark will present a paper on "Ankylosis."

Dr. McKinney moved that the association hold a smoker in January; seconded and carried. Drs. Clayton, Ackerman and Smith were asked to serve as a committee of arrangements for this smoker.

Meeting adjourned.

W. REID BLAIR, Secretary (M. B.).

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION.

The first semi-annual meeting of the Central New York Veterinary Medical Association was held on Friday, November 25, at the Vanderbilt Hotel, Syracuse, New York, many of the prominent veterinarians of Central New York being present. Much interest is shown by the members of the profession in the welfare of this society which was organized in June of the present year and but recently incorporated.

Dr. W. G. Hollingsworth, of Utica, the president of the association, acted as chairman. The morning session was called to order at 10 o'clock and an informal discussion of subjects of professional interest ensued. At 12.30 adjournment was taken for lunch. Upon re-convening at 2 p. m., a business session was held at which time applications for membership were received from nine veterinarians. These were referred to the Board of Censors and, upon a favorable report from that body, the men were duly elected to membership. Dr. V. A. Moore, Dean of the New York State Veterinary College, who was present throughout the convention, was elected to honorary membership. Upon the conclusion of the business session, the following papers were presented by members of the society: "Utilizing a By-Product," Dr. J. M. Currie; "A Few Cases that We Meet in Everyday Practice," Dr. J. A. Pendergast; "A Little Bit of Everything," Dr. J. G. Hill; "Verminus Bronchitis," Dr. G. S. Elliott. Address: "Promotion of Veterinary Science and Education," Dr. V. A. Moore.

The closing feature of the convention was a banquet held at the Vanderbilt Hotel at 7 p. m. A pleasing menu was provided by the management of the hotel and it was thoroughly enjoyed by those present. At the conclusion of the dinner, toasts were called for by Dr. H. A. Turner, as toastmaster, and responses were given by Dr. D. M. Totman, a prominent physician and officer of the Health Department of Syracuse, and by the Honorable George W. Driscoll, one of the city's most prominent attorneys. Dr. V. A. Moore and other members of the society also spoke at this time. At a late hour the convention was adjourned and those present left the banquet hall, feeling that, as a society, much had been accomplished, and as individuals, much had been gained.

W. B. SWITZER, Secretary.

WASHINGTON STATE COLLEGE VETERINARY MEDICAL SOCIETY.

The regular meeting of this society was held November 4, 1910, President Prior occupying the chair. After calling the meeting to order and the reading of the minutes of the previous meeting, Mr. Prior read the program for the ensuing year. The work as outlined proposes to have each member of the society address the members upon some topic of general interest to the profession during the college year.

Mr. Davis, of the *Washington Agriculturist*, addressed the society and stated the need of a veterinarian or a veterinary student on the editorial staff of that publication. This was followed by a general discussion on the subject. Drs. Ralston and Hildering and Messrs. Prior and Clark spoke in favor of this action. President Prior appointed Mr. Thompson Veterinary Editor of the *Washington Agriculturist*.

The following program was then rendered:

"Distemper of the Dog," Dr. Hildering.

"The Study of the Dog," Mr. Donohue.

Both of these papers show the need for much canine study in the veterinary colleges. Dr. Hildering's paper was particularly instructive and entertaining, and the subject was treated in a thorough manner. This paper created considerable discussion and a vote of thanks was tendered to Dr. Hildering.

The arrangements for the annual veterinary banquet and the Veterinary-Pharmacy football game were then discussed, after which the meeting adjourned.

R. J. DONOHUE, Secretary.

SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY.

A regular meeting of this society was held November 5 at 8 p. m. Dr. V. A. Moore introduced as the speaker of the evening Dr. E. B. Ackerman, of Brooklyn, N. Y., president of the New York State Veterinary Medical Association. Dr. Ackerman took for his topic "The Practical Examination of Horses for Diagnosis and Soundness." He said in part: "This is a somewhat broad subject and I am not going into detail in treating it, but I shall deal with generalities. These remarks are not taken from any books but are the result of years of practice in judging horses." Dr. Ackerman then gave practical methods for detecting defects which to the untrained man would pass unnoticed. He said in closing: "Many of our diagnoses are made by exclusion. For some reason it cannot be this, it cannot be that for another reason, and finally it narrows down to a short list from which you can determine the trouble. Oftentimes little things which do not seem to amount to a great deal, if carefully done will count much toward your success as a practitioner." Another meeting of the society was held November 19. Two papers were read by students of the Veterinary College. The subjects of these papers were "An Outbreak of Anthrax" and "Diagnosis and Treatment of Cases of Purpura." A discussion followed the reading of each paper.

C. P. FITCH, Corresponding Secretary.

REPORT OF COMMITTEE ON STATEMENT OF FUNDAMENTALS OF GOOD STATE LIVE STOCK SANITARY LEGISLATION.

Adopted by the United States Live Stock Sanitary Association, Chicago, December 7, 1910, as standard and model for the United States.

Committee.—M. H. Reynolds, Chairman, University of Minnesota and State Live Stock Sanitary Board; Paul Juck-

niess, State Veterinarian, Nebraska; D. F. Luckey, State Veterinarian, Missouri; M. P. Ravenel, Member Wisconsin Live Stock Sanitary Board; F. S. Schoenleber, Kansas Agricultural College and Experimental Station; R. P. Steddon, Federal Bureau of Animal Industry.

1. Legal provisions should be so made that the executive officer must be a veterinarian.
 2. The executive officer should be appointed by a small non-partisan board.
 3. Said board should consist of stockmen and veterinarians.
 4. Final authority for general policies and general methods should rest with the board.
 5. Election, term of service, and pay of executive officer and other appointees engaged in state live stock sanitary control work should be in the hands of the board.
 6. Board members should do no field work in person and should receive no pay other than actual expense incurred in attending necessary board meetings.
 7. The board should be invested with authority to suitably dispose of animals affected or exposed to communicable disease.
 8. The board should be authorized to issue necessary operative quarantine regulations.
 9. The executive officer and deputies should be invested with necessary power so that they may enter premises, inspect, quarantine, and enforce disinfection.
 10. The law should prescribe penalties for violation of law or regulation.
 11. The law should provide that anybody who knows of or suspects the existence of any communicable disease must report to the state under penalty.
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THE following poetic expression of appreciation from Dr. E. D. Hudson, Gettysburg, Pa., December 14, 1910:

Oh you AMERICAN REVIEW,
We cannot do without you;
Oh, no, not I,
I'd sooner do without my pumpkin pie.
You're welcome to my \$3.00 and a rousing cheer,
With a Merry Christmas and a Happy New Year.

AMERICAN VETERINARY REVIEW.

FEBRUARY, 1911.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, December 15, 1910.

CONTAGIOUS EPITHELIOMA OF BIRDS.—Although this disease is quite familiar to many of our readers, I may extract from the review that I read on the subject in the *Journal de Zootecnicie* by Mr. Roquet, if not the whole subject, at least some part which may be of greater interest.

Epithelioma Contagiosum, *Molluscum Contagiosum*, or plainly the Contagious Epithelioma of birds, is a special contagious disease of the skin characterized by the presence of epithelial tumors, varying in size from that of the head of a pin to that of a hazel nut and localized principally on featherless parts of the head.

This disease presents, with eruptive affections of man and of animals, analogies which have caused it to be called by some *Aviary Variola*. It was even believed years ago that epidemics of human smallpox had for its origin the epidemics of variola in birds. To the anatomo-pathological point of view, it offers also undoubtful similarities with epithelial cancer: the presence of inclusions, in the epithelial cells, found also in most of eruptive diseases and in some epitheliomas have served to establish the parasite origin of the tumors. At the present time and since

the researches of Marx and Sticker in 1902, it is admitted that the virus is a filtering ultra-microscopic microbe.

General consideration on the etiology is deserving attention. In 1865 Rivolta was the first to describe in the lesions of the disease intracellular formations similar to those that Virchow had already studied in the Molluscum Contagiosum of man, and he considered them as parasites.

With Silvestrini, he assimilated them to coccidies, even calling those met in the lesions of the heads of fowls *Psorosperma Crouposum*, and considered the disease as a cutaneous psorosperma. In 1873 Bollinger insists upon the anatomical aspect of the lesions and classes them with epitheliomatous eruptions. For him, it is closely related to Molluscum Contagiosum of man or the Follicular Psorosperma described by Darier. Marx and Sticker in 1902 demonstrated that the liquid obtained by crushing a tumor from a hen in physiological water and filtering it on a Berkefeld, was virulent. This fact was confirmed in 1904-1905 by Juliusberg with tumors of pigeons and for molluscum of man.

In 1904 Borrel advances the idea of the bacterian nature of the intracellular inclusions, in which he had observed numerous micrococci. Burnet in 1906 confirmed the same hypothesis. Recently several authors have considered the disease and the diphtheria of birds as two different aspects of a same disease, as it would have the same virus for both. This conclusion is supported by Schmidt. For him, if diphtheritic membranes are inoculated into a great number of fowls, on the mucous membranes or on the skin, most of them will contract only the ordinary diphtheria, but some will have the typical lesions of Molluscum Contagiosum.

In 1909 Bordet and Fally, in a series of experiments, by inoculating diphtheritic products have obtained always diphtheria and never contagious epithelioma. For Gratia, leaving aside the contagion, he believes that there is not any connection between the two diseases to the clinical nor the anatomo-pathological point of view. However for Uhlmuth and Manteufel the causal

agent of aviary diphtheria and of contagious epithelioma is the same; both affections constitute a single morbid entity which varies only in its localization.

In his review, Mr. Roquet continues with the consideration of the clinical symptoms of the natural affection and then the



CONTAGIOUS EPITHELIOMA
OF A PIGEON.

Experimental disease obtained after
several days of incubation.
(Photo by M. Auger.)

manifestations of the experimental disease, *Epithelioma Contagiosum* being an excellent one for study when pigeons are taken as subjects for experimentation.

Indeed, to inoculate a healthy bird, it is sufficient to scarify or make slight excoriations on the skin and then rub the part

directly with the excised tumor, with scabs scraped from it or with the fluid that is made by crushing them in a little water. After four or five days of incubation, the tumors will make their appearance. If extensive lesions are desired the feathers are pulled away from the neck of the bird, from the beak to the wings or from the throat to the cloacum and the whole surface is rubbed with a dilution of the virus. At the point of implantation of every feather a tumor will develop as shown in this plate. Intravenous inoculations will also give positive results and the ingestion of grain impregnated with virus has also been followed by the apparition of the disease.

The virus of contagious epithelioma exists in the epidermis in very great quantity. The very slightest solution of it, even if diluted two thousand times, will reproduce the disease, and its properties are kept for a long time, resisting for months and months. It is a filtering virus, says Burnet, but the results obtained with the Berkefeld bougies are not always the same. Some birds are enjoying natural immunity and all pigeons are not equally susceptible to the attack. Those that have recovered from spontaneous or experimental disease possess a very strong immunity, but only of short duration. Often after two months they are susceptible to become sick again. Anyhow the immunity varies. After a very severe eruption it is strong and lasting. After a short and benignant attack, it is limited and short. In this case reinoculation gives only a slight and short disease. Treated by heat, the virus does not give immunity whether injected by the skin or in veins, and no matter in what quantity it is administered. Only the living virus gives immunity. The microscopic examination of frottis from the eruptive tumors has shown gatherings of very fine granulations resembling very much the microbes of pleuro-pneumonia. They were microbes, extremely fine, filtering, isolated or grouped in diplococci, chains, or staphylococci and surrounded with a kind of mucous envelope. Their number is enormous and it explains the extraordinary abundance of the virus.

The treatment of this affection is simple. Its prophylaxis consists in avoiding the contact of animals among them. Thorough disinfection is very necessary but difficult to obtain. The therapeutic treatment is excision of the epithelial formations and cauterization with iodine or nitrate of silver.



PRECIPITO-REACTION IN THE DIAGNOSIS OF TUBERCULOSIS.

—Although tried already in 1907 by Bonome, this method has not yet entered largely in general practice, notwithstanding the various attempts which have been made in some countries for its introduction. The principles of the precipito-reaction or diagnosis rests on the production of anticorps, specific towards an antigene (in this case tuberculous bacilli), having given rise to an infection or having been used to immunize an animal. Anticorps may be classified in two great groups: some acting as coagulating (coagulines, principally the precipitines) and the others in dissolving (lysines).

Prof. Vallee and Mr. Finzi in their laboratory have worked up the method and the technic that they recommend is the following: 1. Take, by bleeding at the jugular vein with a trocar or a small syringe, a certain quantity of blood from the animal which is to be tested; leave it coagulate, until complete retraction of the clot, at the temperature of the laboratory; use only the serum which is supposed to contain the specific precipitines. 2. Select the antigene, which is either the bouillon which has been used for the culture of bovine bacilli; this is filtrated *on paper*, and to which may be added carbolic acid in the proportion of 2 per cent. 3. Mix in another test tube four parts of the serum and one of the filtered bouillon; mix in a second test tube, which will serve as control, serum and fresh normal bouillon in the same proportion; place the two test tubes in the autoclave at 38° from one to two hours, and then leave them at the temperature of the laboratory for at least the same length of time. 4. Examine them. If the animal from which the serum was obtained

is tuberculous, the contents of the first tube will be cloudy and then will have a precipitate, flaky and whitish. If he is free from tuberculosis, the mixture will remain clear. The control tube will never show any precipitate.

In the publication that was made by Prof. Vallee and Mr. Finzy they propose another method, simpler and as certain in its results. Instead of using bacillar bouillon, as antigen, they utilize the serum of a horse, hypervaccinated against human bacilli. One part of the serum to be examined is mixed in test tubes with two of hyperimmunized serum. Control tubes are likewise prepared and all are exposed to a heat of 38° for two hours as in the preceding method. When the serum tested comes from a tuberculous subject, a fine precipitate, which remains floating in suspension, is found in the corresponding test tube.

The results of the precipito-reaction by the two methods are extremely certain and univocal for the diagnosis in question; 107 animals have been tested (bovines, dogs, horses); their pathological condition, as far as tuberculosis went, was controlled, *a priori* (experimental tuberculosis) or *a posteriori* (tuberculin test or post mortem); forty-eight were tuberculous. The final indications were conclusive, with the difference that the intensity of the precipito-reaction varies according to the method used and the extent of the tuberculous lesions. For instance, while with limited and recent lesions of tuberculosis, the serum of the sick animal gives only a weak precipitate, with the bacillar bouillon, with the hyperimmunized serum the reaction is much more marked. With a tuberculous animal having extensive lesions, it is the opposite. The serum of bovines vaccinated against tuberculosis and resisting intravenous inoculations of very virulent bacilli, precipitates bacillar extracts, but not hyperimmunized serum. The precipito-reaction is specific. It is not obtained with animals that are not tuberculous, but which may, however, have another disease. It is principally negative with echinococcosis, and paratuberculous hypertrophying enteritis. And consequently, although of a practical limited application, it

must be recommended for the diagnosis of tuberculosis in dogs with which tuberculin gives such uncertain results. This method will also be advantageous when, notwithstanding the use of large doses of tuberculin with temperature registered immediately, and where the serial ophthalmic-reaction are so advantageous, there will be some litigious cases. And again in animals prepared by fraud to conceal or alter the results of the tuberculin tests, as in those cases where repeated injections of tuberculin have been made, the reaction instead of being concealed, is on the contrary considerably more marked. It is a valuable thing to remember.

* * *

IMMUNIZATION AGAINST BOVINE TUBERCULOSIS.—As our readers know, official experiments have been carried out in the kingdom of Saxony by government order. These experiments were begun in 1904 and Prof. Doctor Edelmann, of Dresden, made his report some while ago and published it in the *Bericht Ueber das Veterinarwesen im Königreiche Sachsen*.

In 1904 it was first proposed to test the method of immunization preconized by Von Behring with the bovo-vaccine. But in 1906 Prof. Klimmer, of Dresden, having advocated the use of a new vaccine, the *Antiphymatol*, it was decided to test it also in these experiments. The operations were carried out upon 1,600 animals—600 being treated by Behring's method and 1,000 by Klimmer's.

The keeping condition of the animals varied very much. In two herds only all the animals were kept in the field from spring to fall as long as the weather permitted it. In most of the others the young animals only went to pasture in fields surrounding the farms. Some animals were kept working. Generally the young subjects were kept in pasture from four to five months. The hygiene was good. The calves were fed with milk from their mother for three weeks and later with mixed milk. The results of the vaccination by both methods are minutely detailed in the report with the results noted and the con-

clusions presented by Doctor Edelmann, benevolent as they are, seem to condemn both methods by the following

Conclusions.—1. The inoculation of Von Behring's and Klimmer's vaccines are well supported by bovines.

2. An increase in the resistance of the vaccinated animals to the natural contagion of tuberculosis, compared with that of the non-vaccinated, has not been noticed.

3. A curative action of *Antiphymatol* upon tuberculous organisms has not been demonstrated by the indications furnished by tuberculin. Evident proofs have not been found in relation to the influence of antiphymatol upon the anatomo-pathological evolution of the tuberculous lesions.

4. A prophylaxy of tuberculosis of bovines by the methods of Von Behring or of Klimmer, without the addition of prophylactic hygienic measures against natural contagion, seems ineffectual.

5. It remains to be found out if the method of Klimmer, associated with some other hygienic measures, can be utilized. Of all the six hundred animals of the Behring's lot, four hundred and fifty were yet alive, and of the Klimmer's lot nine hundred remained in observation.

Decidedly, immunization remains yet an unsolved problem.



TUMORS OF LOWER VERTEBRATES.—In reviewing in my last the excellent article of Prof. Petit on malignant tumors, I alluded to what he said relative to tumors in the lower class of animals, viz., that he had not carried his investigations yet in that direction. At the International Congress for the study of cancer, Mrs. Marianne Plebn, of Munich, made the following report on this question, which deserves some attention:

The existence of true tumors is at present recognized among reptiles, amphibian animals and fishes. In reptiles only benignant tumors have so far been found. In amphibians epitheliomas only are known to exist. But in fishes all the varieties of be-

nignant and malignant tumors, visceral as well as tegumentary, have been observed. The cutaneous carcinomas of the cyprinidæ, often extensive and spreading in tissues, are compatible with long life. On the contrary, benignant tumors of the gills kill rapidly by functional inability of these organs.

Malignant tumors are specially observed in old fishes, but have also been seen in some aged but one or two years. Living in freedom or in captivity, in sea or fresh water, seem to have no action on their development.

Some tumors appear in epidemic form such as the variola of carps, branchial epitheliomas of cypridinæ, thyroidian epithelioma of salmonidæ. Mrs. Plebn has observed in young fishes spread and infiltrating tumors developed round parasite myxosporidæ. Mr. Gaylord, of Buffalo, has observed four epidemics of thyroidian tumors in salmonidæ. In one single breeding place, three thousand animals became affected with neoplasms in a few months. The disease followed the course of the water, beginning above the current of the stream and progressively spreading downwards. It attacked fishes of all ages, whether living free or in captivity. The disease seemed to be connected with a peculiar condition of the water. Young puppies, yet sucking their mother and receiving besides only water from the contaminated places, became affected with goitres. The people living along the shores of those waters were similarly affected. The histological study of the goitres from those fishes, puppies and the people showed that the tumors had the characters of malignant neoplasms.

These facts have certainly a great importance on the general and scientific point of view of comparative pathogeny of tumors and must prove of interest to the sanitary veterinary inspector of fish markets.



DURATION OF RABID VIRULENCY.—Dr. P. Remlinger already so well known by the numerous investigations he has made and recorded on rabies, has recently called the attention

of veterinarians to the persistency of the virulence of the brain of rabid subjects when placed in similar condition, by the relation of his late experiments.

Rabbits' brains that had died by the inoculation of fixed virus, were placed in and covered with either inert or antiseptic powders and kept exposed to the temperature of a room. After several days, varying in number, these brains were taken off the powders. On the level of the floor of the fourth ventricle of the brain some of the nervous substance was taken, triturated, mixed in emulsion with sterilized water and used to inoculate rabbits by trephining. As means of comparison, the same operation was carried out with other brains kept in the cooling rooms with temperature varying between +5° and +10°.

From these experiments made on 206 animals, it is proved that the brain of a rabbit dead with fixed virus keeps its virulence nine days in saccharine powder, fourteen in bicarbonate of soda, thirty-four in camphor, forty in talc, forty-two in boric acid, fifty in powdered sugar, sixty in common salts, seventy-two and perhaps longer if left by itself at a temperature varying between +5° and +10°.

These figures show that there is not necessary connection between the general antiseptic properties of a product and its special destroying power towards rabid virus. However it is not easy to tell the exact part which belongs to the facility of penetration to the sensibility of the chemical product with the nervous substance, or to its elective antiseptic powers towards the virus.

In the various powders which have served for the experiments, adds Dr. Remlinger, the rabid virus disappears suddenly. A brain may or may not kill. When it does, it is only exceptional to observe a prolongation, always very short, if any of the period of incubation or of the stage of acme. The rabies observed in the trephined animals has always been the classical paralytic form of the disease. Slow consumptive or cachectic rabies has never been observed, even with the most attenuated virus. It may, however, be noticed, without giving to it much

importance, that trephined animals inoculated with brain covered with bicarbonate of soda and used only at the limit of the preservation of the virulence, say thirteen or fourteen days, have presented symptoms of excitement analogous to those of furious madness.

This information has a great value for the question of the transporting or sending of rabid brains from one place to another. If one has not at his disposal neutral glycerine, let him simply place the suspicious brain into common salt, where the virus will keep its perfect and unaltered virulence for more than two months. Or if salt cannot be had, use powdered sugar.



SUNDRIES ON TUBERCULOSIS.—From the report of the chief veterinarian, Mr. Martel, to which I refer further on, I extract a few facts which can be of interest to sanitary inspectors first, and again to pathologists as well.

The first of these relates to the frequency of tuberculosis according to organs and regions. Unfortunately this covers only the observations taken in two slaughter houses. In them there were found in 1909, 837 cases of generalized tuberculosis, 3,692 of localized in the thoracic cavity, 45 in the abdominal, 1,388 in both cavities. In 1,742 cases only one organ was diseased and in 1,955 several.

The organs that were found the seat of lesions were as follows: 4,315 tuberculosis of the lungs, 79 of the heart, 44 of the pericardium, 771 of the mediastinum, 1,488 of the costal pleura, 682 of the prepectoral lymphatic glands, 3,658 of the bronchials, 2,082 of the mediastinal glands, 410 of the sus-sternals, and 30 of the intercostals.

The liver was diseased in 1852 cases, the spleen in 365, the peritoneum in 645, the digestive organs in 368, the kidneys in 38, the intestines in 298, the mesenteric glands in 1,163 the hepatic glands in 1,506 and the renals in 58. The udder was affected in 70 cases and the lymphatic glands of the mammae in

851. The tongue had lesions in 47 cases, the sub-glossal glands in 290, the retro-pharyngeals in 1883, the prescapulars in 103, the axillaries in 12, the prerurals in 37, the popliteals in 12, the ischiatics in 29, the iliacs in 248 and the sub-lumbars in 163.

These statistics will no doubt prove of value and interest to sanitary inspectors as some of them have already provided us with similar statements.

The second extract from the report mentioned refers to the duration of the virulence of tuberculous bacillus in milk. It relates to three inoculations that were made on guinea pigs with the milk from a cow that had tuberculous mammitis. One guinea pig was inoculated the 19th of February under the skin of the thigh with milk that had been drawn the 11th of January, say 39 days before. On the 25th of February, the prerural lymphatic gland was hypertrophied and fluctuating. On March 1st there was an ulceration at the point of inoculation, the lymphatics of the opposite side is also hypertrophied. The animal died April 16th, fifty-six days after the inoculation. He was much emaciated. Post mortem revealed tuberculosis of the thoracic and abdominal organs.

A second animal is inoculated in the same condition with milk drawn and kept for 118 days. On August 20th the glands closed to inoculation are indurated and hypertrophied. On September 25th the ulceration occurs and the pig died on December 10th. Post mortem: Excessive loss of flesh, spleen and liver full with tuberculous deposits, also the kidneys, super-renal glands and lungs. The lymphatic glands of both splanchnic cavities are hypertrophied. Few bacilli were found with the microscope. A third guinea pig was submitted to a similar experiment with milk drawn and kept for 184 days. When killed the animal showed no lesions whatever and all the organs were healthy.

Conclusions.—After 39 days the bacilli of milk possess all their virulence and kill a guinea pig in the ordinary length of time; after 118 days, although attenuated, the virulence is yet sufficient to kill an animal in 120 days after the inoculation; but

after 184 days, the virulence is so weak, perhaps it is all gone, that it cannot give rise to any lesion by subcutaneous inoculation.



A TRIP THROUGH EUROPEAN SCHOOLS.—In Prussia, by a Royal Order of September 5th, the question of the *Doctorate* for veterinarians has received a definite solution. The Prussian veterinary schools of Berlin and Hanover will now confer the degree of Doctor Medicinae Veterinaræ. In abbreviation, the title will correspond to the D. V. M. of some of our American schools. This is a step which will be approved by many and which deserve a congratulation to our confrères from Germany. The degree may be granted under certain conditions and after examination to German graduates or to foreigners who shall have passed the professional veterinary examinations and also as honorary and as exceptional distinction to those who may have rendered great services to the advancement of veterinary science.

In Wurtemberg.—Founded in 1821 through the exertions of veterinarian Walz, the school of Stuttgart has had a brilliant history, having counted amongst the celebrities of its faculty Hering, Baumeister, Leyh, Frohner and Sussdorf who is at present the director. It had been a question for some years to rebuild the former school. But the government of Wurtemberg decided to close the institution to take place at the latter end of 1915.

In Italy.—The subject of the reorganization of the veterinary schools was brought forward before the Superior Council of Public Instruction. The reorganization has three important objects in view: increase the national patrimony, co-operate to the protection and improvement of public health and give a greater and more national extension to national economy.

In Denmark.—At Copenhagen a monument has been erected by Danish veterinarians in honor of Peter Christian Abildgaard, founder of the Copenhagen College. Prof. Bang reviewed the life of this great veterinarian who had studied his profession in Alfort at the time of Bourgelat.



BIBLIOGRAPHIC ITEMS.—This month I have to glance at Sanitary Reports that I have received. One from the Continent of Europe and the other from across the Atlantic. The first is the report of Mr. Martel, the Chief Veterinarian of the Sanitary Service of Paris and the Department of the Seine. It is a large book of over 300 pages, where the work of the veterinary staff is minutely laid out and illustrated by numerous plates of statistics, which are to the initiated of real interest. I may, amongst the contents of this elaborate report, take in consideration two points. First is the subject of rabies, which is relatively frequent in France, where the number of lost or erring dogs remains considerable. Indeed, says Mr. Martel, France has a greater quantity of dogs far superior to any acknowledged by other states. In France there are said to be 70 dogs for every 1,000 inhabitants, while there are but 38 in England, 31 in Germany, and 11 in Sweden. And yet rabies in France seems to be on the decline taking into consideration the number of cases recorded since 1900, when there was recorded 2,771 cases, while in 1909 there were but 1,463. The second subject of this report where the interest is great is that of tuberculosis. It is a subject which is of actual interest and will remain as such for years to come. In relation with it, the report contains records of numerous experiments which have been carried out by Mr. Martel's staff, viz., inquiries and experiments on the intra-dermo reaction, on the second ophthalmic-reaction combined with the thermo-reaction on the single ophthalmic-reaction combined with the subcutaneous injection of tuberculin, on the diagnostic value of the second oculo-reaction. All of which show the importance that is attached to those various modes of using tuberculin for testing cattle. The résumé and conclusions found from these experiments are as follows: Second oculo-reaction is the rule in animals that ought to react to tuberculin. It brings out the general reaction, so to speak, reinforce it and draws the attention upon animals in which the thermic reaction is slow to develop. It constitutes a local reaction (which is wanted in general tuberculination) and is to tuberculous animals that, which with the

swelling at the point of inoculation, is in glandered horses, in the test with malleine. Obtained in good condition, ocular reaction gives by itself a very suspicion of tuberculosis. It is a means of control in cases of fraud. It is a good method of diagnosis which deserves to be used in practice. The balance of the report treats of hippophagy in its various points of view, the inspection of abattoirs, inspection of meat, of milk, etc., etc., all of which are of value to sanitarians.

The second report that I have to consider is that of the Chief of the Cattle Bureau, Dr. A. Peters, to the State Board of Agriculture of Massachusetts. Of much less importance than the preceding, the sixteenth semi-annual report brings out important facts. First, after a few general remarks, among which is advanced the good news that "there seems to be no further danger of any more outbreak of foot and mouth disease from stated source" (deficient manufacture of vaccine), the report enters into the consideration of contagious diseases. For rabies a table shows that for the year ending Nov. 30, 1909, there were 461 dogs, 16 cattle, 1 horse, 5 swine and 1 goat that were killed, had died, had been or were yet suspicious of rabies. For glanders there was a marked reduction in the number of cases of glanders or farcy. Tuberculosis is the subject of several statistics and is followed by conclusions relating to miscellaneous diseases, to meat inspection, to licensing slaughter houses and finally with the financial statement the report is closed.

THE GID PARASITE AND ALLIED SPECIES OF THE CESTODE GENUS MULTIPLEX is the title of a publication by the Bureau of Animal Industry in Bulletin 125.

The first part just issued gives the historical review and is due to Mr. Maurice C. Hall of the Zoological Division of the Bureau. "Succeeding parts will follow concerning the morphology and life history of the parasite in question, as well as the symptomatology, treatment, prophylaxy of that disease." It is certain that the complete series of the work that Mr. Hall has been carrying out will prove of great interest to breeders, to veterinarians and to helminthologists. The careful and complete

historical sketch of *Multiplex Multiplex*, the name that Mr. Hall proposes for the *Coenurus Cerebralis*, the concise one of *Multiplex Serialis*, of *Multiplex Lemuris*, of *Multiplex Polytuberculosis*, *Multiplex Spalacis*, of *Cysticercus Botryoides* and of *Acephalocystis Ovis Tagelaphi* shows the great amount of research the author has made and the difficulties that he has had to overcome. The subsequent parts of Bulletin 125 will certainly be looked for by anxious readers.

A. L.

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THE IMPORTANCE OF UNIFORMITY IN VETERINARY DEGREES AND MATRICULATION REQUIREMENTS.—The above two subjects are undoubtedly among the most important, from a veterinary view-point, to-day, and have been matters to which President Glover, of the A. V. M. A., has given serious consideration for some time; long before the American veterinary profession honored him with the highest mark of recognition that it can confer upon a veterinarian. At Chicago in 1909 in his paper presented to the Association of College Faculties and Examining Boards on "Matriculation Requirements for Veterinary Colleges," after presenting the subject in a most lucid manner, the doctor made an appeal to the American Veterinary Medical Association for support, stating that "the time had arrived when the American Veterinary Medical Association should make a determined stand, not only for a higher matriculation standard, but for uniformity as well"; and his auditors at San Francisco were convinced that he had not changed his views. His San Francisco paper appears on page 634 of this issue of the REVIEW, and also a communication to the members of the A. V. M. A. on page 685. We sincerely hope and *trust* that after the profession have read these two communications, and realized the importance of the subjects presented in them, they will immediately begin to formulate plans whereby they may assist President Glover in their accomplishment.

ORIGINAL ARTICLES.

THE SOURING OF MILK.*

By G. R. FETHEROLF, V.S., CITY MEAT AND MILK INSPECTOR, READING, PA.

The most common change in milk is its souring and curdling, with the production of lactic acid as its chief product. This change does not occur spontaneously, nor is it a necessary and invariable change. Milk, under some special precautions, may be drawn from the udder and kept in sealed vessels for weeks and months without any apparent change whatever. To obtain this result is a most tedious undertaking, so much so that milk produced under almost the most sanitary methods invariably becomes sour. Indeed, so regularly does this change manifest itself, that at any time it does not materialize in milk that is kept at 98 to a 100 degrees Fahr. in sixteen to eighteen hours, the fact at once arouses suspicion that some means were employed to keep the milk sweet by the use of preservatives, or by pasteurization.

Lactic acid responsible for the souring of milk was first discovered in milk by Scheele in 1780. Nothing was known as to the formation of lactic acid even as late as 1847, when Blon-deau discovered micro-organisms in sour milk, but gave no relation existing between the germs, lactose and the acid.

Pasteur in 1857 in one of his noted investigations, came to the conclusion that the souring of milk is some kind of a fermentation caused by the action of a peculiar micro-organism which is called "levure lactique" (lactic yeast).

* Presented at the June, 1910, meeting of the Schuylkill Valley Vet. Ass'n, Reading, Pa.

Since then our knowledge of lactic fermentation has been considerably extended by the students of Pasteur and other noted bacteriologists and chemists.

It is now universally known for the last decade at least that the lactic acid fermentation in milk is a chemical change of lactose into lactic acid, caused by a variety of micro-organisms known in common as the lactic acid bacteria.

Milk contains lactose (milk sugar) averaging 4 per cent. The chemical change of lactose to lactic acid, expressed by the formula $C_6H_{12}O_6 = 2C_3H_6O_3$ is very complex.

This change is not yet fully understood, and it is sufficient for us to know that milk sugar is changed into lactic acid due to an enzyme secreted by the lactic acid bacteria, and is therefore purely an enzymic function.

A number of scientists have fully substantiated the fact experimentally; in particular, Herzog extracted an enzyme from the bacterium acidi lactici, which, in the absence of the organism, was able to transform lactose into lactic acid.

The degree of acidity of milk can be determined by titrating a certain quantity of milk with a known standard solution of sodium hydroxide ($NaOH$) using phenolphthalein as an indicator.

Two kinds of acidity may be distinguished in milk and its products, (1) apparent acidity and (2) acidity due to lactic acid. The former is due to the presence in normal milk of casein and acid phosphates, which have the power, like free acids, of neutralizing alkalis. The amount of it is on the average from .07 to .08 per cent. varying with conditions, increasing for instance with the advance of lactation. The latter due to lactic acid is formed in milk after it is drawn, and is caused by the action of certain forms of bacteria on lactose (milk sugar). Hence, when milk contains 10 per cent. of acid, it already contains some lactic acid.

The total amount of lactic acid may be determined by the difference between the total amount of acid and the apparent

acid. In speaking of the acidity of milk, we refer to the total amount and not alone to lactic acid.

As soon as a slight amount of acid is formed, it combines with the calcium of the calcium casein, forming calcium free casein. After the formation of a greater quantity of acid, the acid combines with the casein, forming casein lactate. This substance being insoluble in water is precipitated and is commonly known as the curd. This latter change takes place when the acidity is from .7 to .9 per cent. Any other acid poured into milk will cause the same result. Milk soured by the action of bacteria can only reach an acidity of 1.5 per cent. to 2 per cent. Larger amounts of acid check the life and growth of the organisms. If it is desired to change all of the lactose into lactic acid, the acid must be neutralized as fast as it forms, with chalk or carbonate of zinc.

KINDS OF LACTIC ACID.—It is a well known fact that four isomers of lactic acid exist, although only three need to concern us here. An aqueous solution of one of those rotates the plane of polarization to the right and is called dextro or right-handed lactic acid, and is designated as the d-lactic acid or simply d-acid. The second, laevo or left-handed lactic acid, and is designated as l-lactic acid or simply l-acid. The third, inoccative or rocemoid lactic acid and is designated r-acid. These various kinds of lactic acid are the result of the action of various forms of the lactic acid bacteria as will be more definitely brought out later on.

EXTERNAL CONDITIONS AFFECTING LACTIC FERMENTATION IN MILK.—Time and temperature are the two chief external conditions necessary for the development of fermentation and the exact time of souring varies in relation to temperature and various cultures. Subject to slight variations, at 10° C. milk becomes sour in 120 hours and curdles on or about the seventh day. At 15° C., it is sour in 66 hours and curdles on or about the seventh day. At 37° C. (blood heat) milk is sour in 16-18 hours and curdles on the second day.

THE LACTIC ACID BACTERIA.—After Pasteur, some of the most noted scientists that isolated lactic acid bacteria were Lister,

Hueppe and Esten. In addition to those, other bacteriologists too numerous to mention separated from milk many various lactic acid bacteria and also gave them distinct names. It is true that these various lactic acid bacteria differ more or less in some minor respects, inasmuch as for instance the time required to curdle milk. Some are capable of accomplishing this chemical change at a certain temperature in a few hours. With others, at the same temperature, it requires several days. Whereas, there are still others which under the same conditions cannot curdle the milk at all.

Whether such bacteria should be separated into different types or species, or whether they represent varieties of the same organism, is a question that caused considerable dispute.

Conn says: "The power of curdling may be increased in the same organism by proper treatment in the laboratory."

Beyerinck makes the statement that the lactic acid bacteria which he studied, could be transformed into one another by cultivation. Many other authorities came to similar conclusions, and, as a consequence, the general opinion of to-day is that bacteria which curdles milk, even if the time required varies extensively, and others which sour it without curdling, cannot be classed as separate types or species, but only as varieties or modifications of the same organism. In reference to other slight differences, it is not yet known to what extent such variations may take place in the same organism. Therefore, it cannot be stated what constitutes a type or specie, and hence it cannot be definitely stated how many types of the lactic acid bacteria there are. Regardless of this fact, however, it has become evident in the last few years that the lactic acid bacteria separate themselves into several more or less distinct types.

Heineman states "that in the ordinary souring of milk, lactic acid is produced chiefly by the streptococcus lactarius and bact. lactis aerogenes and that the former organism predominates in approximate proportion to the purity of the milk." Conn is of the same opinion and also states "that as many as 95 per cent. to 100 per cent. of all organisms in sour milk are of the

bact. lactis acidi or streptococcus lactarius. The more data obtained concerning the lactic acid bacteria, the more evident it becomes that these two named varieties represent very distinct types, and that each of which have many varieties differing in minor respects. Therefore, to understand more fully the lactic acid bacteria, it becomes necessary to study most carefully the characteristics of these several types.

THE BACT. LACTIS ACIDI (*Streptococcus Lactarius*): ITS SOURCE.—This organism is mostly derived from the dust in the air, from the feed of the cattle, the hair and in some exceptional cases from the feces. It develops very rapidly in milk, and when once in the milk pail or can, it has a strong tendency to remain; at any rate, if the utensils are only ordinarily cleaned, as generally is the custom, unless by sterilization in a steam chamber. Hence the most common cause is the milk pail and other milk utensils. It is undoubtedly premature to state much in reference to its original source. Borthel has found the organism on the leaves of certain trees. Whether this source can be regarded as its natural abode is a question. But wherever it does come from originally, it has been fully substantiated, that it is not so vigorous as it subsequently will be when in milk for some hours, proving that the original source is not so well adapted for its welfare in general.

It is not only common in milk in all sections of the United States, but equally as well in Europe and many other sections.

ITS FORM AND HENCE ITS NAME.—There is quite a difference of opinion as to whether it should be called a Bacterium or a Streptococcus. It generally appears in the form of a short non-motile rod, but at other times in spherical pairs, giving the form known as the diplococcus. The longer forms may simply represent the cocci elongating and about ready to divide. Should this be the case, the organism in question should not be called a bacterium, a term applied to those that appear in the form of a rod, but a streptococcus, a term applied to the spherical forms, having one division plane, a most suitable nomenclature then would be "Streptococcus lactarius."

Should it be in the form of a short rod, bacterium would be correct, and the term *bact. lactis acidi* should be used. This organism in question was handed on numerous occasions to various bacteriologists. Some called it a bacterium, others a streptococcus. Although it went by the name of *bact. lactis acidi* for at least a decade, in the past few years many scientists prefer it to be called *streptococcus lactarius*.

THE ISOLATION OF THE BACT. LACTIS ACIDI FROM MILK.—It is comparatively easy to separate this organism from milk. For this purpose, use sour milk that has not yet curdled. Milk at this stage contains millions of acid bacteria, and for this reason should be very highly diluted, otherwise they would appear too close together on the culture plates after becoming developed into colonies. Litmus Gelatin should be used as the culture medium. Incubate the plates at a temperature of 70° Fahr. only, for two to four days. At higher temperatures the gelatin would melt, causing the colonies to become indistinct. After they are developed, they appear in the form of minute red points, representing colonies of the *Bact. Lactis Acidi*. Undoubtedly, several acid types may be found, although a distinction can well be made by using a low magnifying power of the microscope.

The *bact. lactis acidi* appear quite red, very small, growing wholly underneath the surface of gelatin. The most distinctive feature of this type is rather a dense, red colony, showing a series of slight projections around the edge, burr-like. These projections are not always present, but when they do appear, it is positive proof of representing the type of *bact. lactis acidi*. Bacteria that grow on the surface of the gelatin do not belong to this species. It grows altogether underneath the surface of the culture medium.

PECULIARITIES—ITS GROWTH IN VARIOUS CULTURE MEDIA.—One of its greatest characteristic features is that its growth on the surface of any culture medium is extremely slight. It does not grow at all on a potato, neither does it grow on the surface of gelatin plates. On agar slants its growth is so slight,

that it is almost invisible. On close examination, however, it manifests itself as a clear, transparent film. When inoculated into a gelatin tube, it grows well along the needle line, but it stops growing soon as it reaches the surface. Inoculated into bouillon, its growth is so scant that it is scarcely visible. Inoculated into fermentation, tubes containing bouillon to which was added lactose or dextrose, it always shows a slight growth by causing a cloudiness. This condition will appear in the open arm as well as in the closed arm, showing that the bacterium is a *Facultative Anaerobic*.

ITS GROWTH IN MILK.—If this organism is inoculated into sterilized milk, it grows readily and produces acid. Various cultures produce acid varying in rapidity and at times in degree. At blood-heat, 37.5° C., some are capable of curdling milk in six hours. Others it may require under similar conditions, as long as from a day to three days; and still others are unable to curdle milk at all. In all cases, acid is produced, but when the proper degree is not reached, as occasionally is the case, the casein is left in partial solution and no curdling can take place. While such are the conditions resulting from cultures derived from various sources, similar results can equally as well be had from different cultures from the same source. If the weaker culture is transferred for several days from one milk into another, it eventually will become more powerful in the degree of producing acid. Since these varying conditions can all be rectified by proper cultivation, whether the various cultures come from different or the same sources, it is more than plausible to conclude that these various organisms in question are simply varieties, under different conditions, of the same organism, the bact. *lactis acidi*.

ITS EFFECT ON MILK.—This type of organism is considered by the dairyman his friend, par excellence. The curd produced through the action of this type is peculiar and most easily distinguished in as much as it is solid, strongly acid, without any holes, no gas bubbles and occurs without the separation of any whey. This type of curdling is most highly esteemed by the

dairyman, since it is most conducive for dairy purposes, and is in accordance with the production of the best grades of butter and cheese.

Especially so does the cheese manufacturer consider it as he usually makes test as to this desired result before he considers the use of various milks, as he is fully aware of the fact that milk used for the purpose of making cheese, showing different results, would not only be valueless, but would cause a great financial loss to use in connection with good milk.

THE BACT. LACTIS AEROGENES—ITS SOURCE.—This particular type of the lactic acid bacteria produces both acid and gas. It has also many varieties. Like the bact. lactis acidi it is also derived from sources external to the cow, although chiefly from the dust of the air, and in particular from the feces of the cow, dirt, or from any other kind of filth. It may also remain in milk utensils that were not thoroughly sterilized, from one milking to another, and continually cause a whole lot of trouble. In fact, it is considered the dairyman's foe and in order to avoid the contamination of this organism in milk, great care must be exercised in keeping stable and cows clean, adopt up-to-date measures as to milking, in particular use the covered milk pail and sterilize all milk utensils, and keep the milk at a low temperature. The bacterium lactis aerogenes differs in many respects from the bact. lactis acidi. Microscopically, it appears larger than the latter. It is longer than it is broad, proving itself a bacterium beyond a doubt. If inoculated into gelatin tubes, it grows well along the needle line and spreads over the surface. On gelatin plates it grows well on the surface, and appears as a round, elevated mass from 2 to 3 mm. in diameter. On the surface of agar and the potato, it grows luxuriantly, forming a thick white layer. In bouillon, it also grows exceedingly well, forming a turbidity and sediment. In fermentation tubes containing sugar, it grows in both open and closed arm, producing gas, which collects at the top of the closed arm. The formation of gas is very characteristic of this type.

If inoculated into milk, it acts also on the lactose, not only causing lactic acid, but also gas.

The power of producing acid, and the rapidity of curdling, varies also in various cultures.

There is a striking contrast in the appearance of the curd caused by the action of the *bact. lactis acidi*, from that of the *bact. lactis aerogenes*; a typical curd of the latter is more or less full of holes caused by the generation of gas, so characteristic of this type. The whey also separates from the curd, causing the final result to appear strikingly different from that of the first type. There is also a difference in the acid produced by these two types.

The *bact. lactis acidi* produces right-handed acid, whereas the *bact. lactis aerogenes* left-handed acid. The former rotates the plane of polarized light to the right and the latter rotates it toward the left.

Whereas the *bact. lactis acidi* is considered a friend to the dairyman, the *bact. lactis aerogenes* is his foe; in fact, a bitter enemy. If milk contains vast numbers of the latter, instead of the former, when it is used in the manufacturing of cheese, the gas that it forms resulting from its lactic acid fermentation, not only causes a disagreeable flavor in the product, but at the same time induces the cheese to swell, oftentimes to such an extent that they are practically worthless. In the creamery where butter is made, the organism is not nearly as disastrous, but it is also detrimental inasmuch as it causes a most disagreeable flavor in butter.

From the preceding facts, it readily can be seen to what extent this organism may be instrumental in inducing a great financial loss to the dairyman engaged either in the manufacturing of butter or cheese. There is another type producing acid and gas, the appearance of its growth corresponding in most respects with the *bact. aerogenes*, but differs inasmuch as it has flagella and consequently is motile. It is therefore not a bacterium, but a bacillus. To bacteriologists it is known as the *bacillus coli communis*. It is not so common as the other types,

but it is not infrequently found in milk. It is a constant inhabitant of the intestines and hence its presence indicates fecal contamination: It is not a dangerous organism itself, but may signify danger if such contamination can be traced to excreta of typhoid patients or some other affections in particular to animals being affected with tuberculosis. In addition to these several mentioned types of acid bacteria, there are others; but, in a vast majority of cases, milk is soured either by the *bact. lactis acidi* or the *bact. lactis aerogenes*, depending on air circumstances, perhaps mostly on temperature. If milk is kept at 70° or lower, it will, in most cases, be soured by the former. If at 80° or above it is more likely soured by the latter. Milk soured at low temperatures, commonly contains dextro-lactic acid, and if soured at high temperatures, it contains laevo-lactic acid.

THE GROWTH OF THE LACTIC ACID BACTERIA AS COMPARED WITH OTHER FORMS IN MILK.—Milk as it leaves the udder is at a temperature most favorable for the growth of most species. Although different types differ somewhat as to the temperature at which they grow best, but at any rate a great majority will develop most rapidly at 37.5° C. or say from 90 to 100° Fahr. There are some types, however, that prefer a lower temperature; therefore the temperature at which milk is kept largely accounts for the kinds, as well as the numbers that may be found. At the freezing point, 32° Fahr., bacteria do not grow at all. At 33 to 35 in several days they may grow slightly; but at the same temperature for several weeks, instead of a few days, they develop considerably, although the milk not manifesting the chemical change, souring or curdling, an indication to go by, the milk would be used in this highly contaminated state with perhaps serious results.

A similar statement can be made in reference to bacteria at 40° Fahr., excepting that they grow only faster and attain a large number in much less time. Therefore, milk or cream kept at these temperatures, although remaining sweet for a long time, should absolutely be considered unwholesome in course of a few days.

At 50° Fahr. those bacteria referred to at lower temperatures will develop still more rapidly, but not as fast as at higher temperatures. At this degree the lactic acid bacteria do not grow yet, but a large variety of miscellaneous forms will begin to develop. The vast majority of those are harmless forms or types that produce toxins and ptomaines, causing various diarrhoeal diseases, such as cholera infantum and summer complaint.

At 60° to 70° Fahr. bacteria grows still more rapidly; at this temperature the growth of the useful and harmless bact. lactis acidi is favored in particular. At the outset, this type represents only about 1 or 2 per cent., seldom 10 per cent. of the bacteria present in milk. But so extensively do they grow that in twenty-four hours they constitute as much as 50 per cent. In 48 hours they have developed to such an extent and so overshadowed the other bacteria by the amount of acid produced, that they may represent as many as 95 or even 100 per cent. of all the bacteria present in milk. If milk is kept at temperatures varying from 80° to 100° Fahr., altogether different results are obtained. The growth of bacteria is still more accelerated. In some cases at these temperatures, milk may also be soured by the bact. lactis acidi, but as a rule other types will gain the upper hand invariably. The acid producing gas, bact. lactis aerogenes, not infrequently becomes very abundant in milk at these high temperatures and cause great losses to the butter and especially to the cheese manufacturer. It readily can be comprehended how important it is for the dairyman of to-day and the consumer to know at what temperatures bacteria do not grow and at which they grow best.

By knowing how milk can be contaminated and how it can be prevented, dairywork becomes easy and all kinds of undesirable results can be avoided.

DR. F. A. BRITT, of La Harpe, Ill., says: "I would as much think of performing surgical operations without instruments as to practice veterinary medicine without the REVIEW."

DOURINE.*

By J. P. FOSTER, B.Sc., V.S., M.D.V., HURON, S. DAK.

SYNOMYS.—Mal or maladie du coït, equine syphilis, epizootic paraplegia, chancerous epizootic, breeding paralysis.

To the foregoing might be added certain local terms which have been applied to this disease, such as "horse clap" and "horse pox" during the early stages, and "hip disease" after the general symptoms have developed.

The term dourine is perhaps the best as well as the simplest name for this affection, and is said to have been derived from an Arabic word signifying dirt or filth.

This disease is transmitted naturally by copulation and, while the monkey, dog, buffalo, rabbit, rat and mouse are susceptible to it, following experimental inoculation, it will be considered in this paper as essentially a disease of the equidæ.

GENERAL HISTORY AND GEOGRAPHICAL DISTRIBUTION.—Dourine has a wide geographical distribution. It was first described in 1796 by Ammon in northern Prussia. It was at one time quite prevalent in Spain and existed to some extent in France and Germany. Mal or maladie du coït is the name given to the disease in France, where it was reported in 1830. It was also found in Switzerland, Syria, Russia, Poland, Siberia, Italy, and Algeria during the first half of the nineteenth century and, according to one writer, exists at the present time in Hungary, Turkey, Spain, Nigeria, Tripoli, Tunis, Persia, India, Java and Chili.

The disease has also existed to a considerable extent in the United States during the past twenty-eight years and within a comparatively recent date in the Canadian Northwest.

* Prepared for presentation at the Forty-seventh Annual Meeting of the A. V. M. A., San Francisco, Cal.

It first appeared in the United States in 1882 at which time there was quite an extensive outbreak in DeWitt County, Illinois. It was introduced into this locality by a Percheron stallion that had been imported from France; and, although it appears to have been completely eradicated in the territory mentioned, it is evident that exposed animals were removed from the district, to disseminate the infection in other parts of the country. After a lapse of ten years, the disease was reported as existing in northwestern Nebraska.

In 1893 the task of eradicating it was taken in hand by the U. S. Bureau of Animal Industry. The first animal perceptibly affected was a Percheron stallion owned in Gordon, Neb. This horse was a son of the celebrated sire, Brilliant, and was sold by M. W. Dunham, Wayne, Ill., as a two-year-old, to parties near Bloomington, Wis. From there he was taken to Nebraska and was first noticed to be ailing about June 1, 1891. It is probable that the disease was introduced into Nebraska by this stallion. Thirty-two affected animals were found in Nebraska and five in South Dakota during the season of 1893. These were purchased and destroyed and, as no new cases were discovered for a number of years, it seemed as if the eradication of the disease had been accomplished.

During December, 1898, it was again reported as being more or less prevalent in the same district in Nebraska and, early in 1899, the Bureau of Animal Industry for the second time became engaged in the work of its control and extermination. During this year twenty diseased animals were destroyed; for 1900 no statistics available; in 1901 twelve diseased animals were destroyed; in 1902 ninety-five diseased animals were destroyed and twenty-nine diseased stallions were castrated; in 1903 511 diseased animals were destroyed and 1,889 stallions were castrated; in 1904 seventy-six diseased animals were destroyed and 1,103 stallions were castrated.

On account of the spread of the disease the Secretary of Agriculture issued an order under date of January 20, 1903, prohibiting transportation or movement of horses in the counties

of Dawes, Box Butte, Sheridan, and Cherry, in the state of Nebraska, and in the Pine Ridge and Rosebud Indian reservations and the counties of Custer and Fall River, in the state of South Dakota.

In spite of the many obstacles met with, incident to the stamping out of an insidious epidemic of this character under range conditions, the work has evidently been thoroughly accomplished and it is now believed that the disease has been completely exterminated in Nebraska and South Dakota.

During the latter part of 1903 dourine was reported as existing in Van Buren County, Iowa. The report was verified by the state authorities and representatives of the Bureau of Animal Industry, and about twenty affected animals were destroyed during 1904. Suspicion points to an imported Percheron stallion as being responsible for this outbreak. This horse was purchased by a company of farmers and was brought from Columbus, Ohio. This outbreak appears to be the last verified report of the existence of the disease in the United States.

Dourine was first discovered in Canada in 1904, at which time Dr. Burnett, Chief Veterinary Officer of the Northwest Mounted Police, reported its existence in a stallion and several mares near Lethbridge, Alberta.

The biennial report of Dr. J. G. Rutherford, Veterinary Director General of the Dominion of Canada, issued in 1909, shows that from the time of its discovery until the spring of 1908, 628 head of diseased animals were destroyed.

To a Canadian veterinarian, Dr. E. A. Watson, Assistant Pathologist in Charge, Lethbridge Quarantine Station, is accorded the honor of being the first investigator on the American continent to discover the specific organism of dourine in a case due to natural infection. The organism was first demonstrated on February 11, 1907, the material being secured from a vesicle on the mucous membrane of the vulva of a mare owned near Lethbridge. The disease was later transmitted to a nine-months'-old filly, by inoculating her with material taken from the mare just mentioned, the parasite being subsequently demon-

strated in preparations taken from a fresh plaque situated at the seat of inoculation. Dr. M. V. Gallivan was associated with Dr. Watson in this work. These findings were later confirmed by Dr. C. H. Higgins, Pathologist, Health of Animals Branch, Department of Agriculture.

ETIOLOGY.—As it is the purpose of this paper to deal principally with the history and clinical aspect of dourine, its protozoology will be referred to but briefly.

The organism causing this disease is a trypanosome first described in 1896 by Rouget and given the name of *Trypanosoma equiperdum* by Dorflein in 1901.

Buffard and Schneider in 1899 found a trypanosome in Algeria, and produced dourine in a horse with virus that had been passed through a dog, and Nocard later confirmed these results. However, for a time considerable doubt existed as to the presence of a specific trypanosome in the dourine of Europe. It was even suggested by some that there might be two diseases simulating each other, one as met with in Africa due to a trypanosome, the other as seen in Europe, the etiology of which was yet to be determined. This doubt was based upon the fact that although diligently sought for by eminent scientists, the parasite could not be found in the European affection.

In 1905 Buffard and Schneider demonstrated that the disease in France was due to the *Tr. equiperdum*. These findings were confirmed by Leclainche and Lavaran.

Prof. Marek, of Hungary, who failed to find the parasite in cases in his country, and was skeptical as to the identity of the disease, finally discovered it in the blood of a Hungarian stallion in 1905. These findings, together with those of Watson and Gallivan in Canada in 1907, remove all doubt as to the identity of the disease as seen in Africa, Europe and North America.

According to some writers, trypanosomes are found in nearly all of the body fluids during the active stage of the disease. The sero-sanguinous fluid taken from plaques when they first appear or from vesicles upon the vulvo-vaginal mucosæ is the material

from which the parasite is usually recovered. Since equine dourine is transmitted naturally, by coitus, it differs therefore from other trypanosomiases, in that all other forms so far as is known are disseminated by insects, especially biting flies. The virus evidently possesses the power of entering the system through the mucous membrane of the genitals.

Morphologically the *Tr. equiperdum* is indistinguishable from the *Tr. Brucei*, or the *Tr. Evansi*. It floats about in the plasma, but does not invade the red corpuscles.

The stains generally employed in the study of the organism are combinations of easin and methylene blue, such as that of Romanowsky, or its modifications. Farmer, of India, advocates the use of Leishman's stain for fresh specimens, and Giemsa's azur eosin stain when smears are several days old.

SYMPTOMS.—Dourine has been described by some observers as occurring in both acute and chronic forms. The chronic form is the one usually seen. The acute form, said to be more common in the mare than in the stallion, is perhaps due to secondary infection, and death ensues from a sudden attack of paralysis.

Chronic dourine may be divided into three stages. The initial symptoms of the first stage are visible according to some authorities in from eleven to twenty days after coitus, although other writers place the incubative period at from eight days to two months. In the stallion an edematous condition of the extremity of the sheath may be the first symptom noticed, which gradually extends to and involves the scrotum and inguinal region. Erections may be frequent. There may be swelling of the glans penis with congestion of the mucous membrane lining the meatus urinarius, accompanied by more or less urethral discharge. In my own experience I have seen this discharge so profuse as to soil the insides of the hind legs, and in the most typical case that it has ever been my privilege to witness, in a stallion, I discovered several cauliflower-like growths the size of a pea upon the outside of the meatus urinarius and in the urethral fossa. These growths appeared to be similar to the so-called venereal warts, or condylomata of man and are said to be

caused by irritating urethral discharges. Vesicles followed by ulcers often occur upon the surface of the penis and, where these heal, white glistening spots remain, well defined and circular or oval in form. Farmer considers this a leucoplasia rather than a leucoderma. The penis may become pendulous and distorted, and in some cases, either from excessive swelling or par-



Fig. 1. Note Paralysis of Ears, Eyelids, and Under Lip; Plaques on Sides of Body; Emaciation of the Hind Quarters and Position of Right Hind Leg.

alysis, its retraction into the sheath becomes impossible. Frequent micturition accompanied by strangury may be in evidence.

The initial symptoms exhibited in the mare are similar to those affecting the stallion, in so far as the anatomical and physiological differences of the genital organs will permit. Usually the first symptom noticed is swelling of the vulva, the lips of which may be more or less distorted. Urine mixed with mucus may be voided often and in small quantities. The act of micturition may produce considerable irritation as evidenced by stretching, stamping the feet, switching the tail, and eversion of the

clitoris. Higgins believes that the increase of calcium salts in the urine is largely responsible for this irritation. The mucous membrane lining the vulva is congested, and covered by a tenacious, yellowish secretion. Reddish spots, followed by vesicles and ulcers, appear; the clitoris, its prepuce, and the fossa nivalularis being the favorite seats of these lesions. These ulcers persist for some time and do not heal as readily as do those in cases of coital exanthema. The clitoris is enlarged and erect and may be partially or wholly devoid of pigment. The vulva has a "gaping" appearance, showing the exposed clitoris (Fig. 2), which Williams considers characteristic of the disease in young and otherwise healthy mares. There may be a sticky, gelatinous discharge from the vulva which, when mixed with urine, soils the tail and thighs, causing irritation of the skin and loss of hair. Ulcers may develop upon the skin of the vulva and along its muco-cutaneous margins, which when healed present the chalk-white spots, similar to those already described as appearing upon the penis of the stallion. The mammary glands may become involved, as evidence by swelling and even abscess formations. Sexual desire may be increased and the animal is nervous and irritable.

Many of the symptoms enumerated may disappear for a time, and to the casual observer an almost complete recovery seems to have taken place; but after a period of apparent quiescence, the symptoms reappear with renewed activity. One Canadian observer (Warnock) has shown that severe work will develop the symptoms in a latent case where they have not yet appeared, and will cause a recurrence of the same in cases that have apparently made a recovery. He has "made use of this fact in dealing with suspects, by having them broken to harness and worked. If the animal is diseased, marked evidence is apparent in a very short period, death invariably following."

Some writers state that mares suffering from dourine are sterile, and others, while admitting that they may occasionally become pregnant, claim that they invariably abort. Neither conclusion is correct, as mares in the last stages of the disease have

been observed in the United States and Canada with young foals by their sides.

During the second, or "plaque stage," as it is referred to by some writers, general symptoms develop. Those already described become more pronounced. A rapid falling off in condition is apparent, with increasing nervous debility. This change is noticeable in from three or four weeks to as many months, and



Fig. 2. Note "Gaping" Appearance of Vulva; Enlarged and Ulcerated Clitoris; Depigmentation of Vulva and Anus, and Plaques on Insides of Thighs.

may be due to the dissemination of the causative parasite or its toxic products throughout the general system. Experiments conducted by Watson corroborate this assumption. He has demonstrated that copious bleeding at this stage of the disease produces a temporary improvement, and the nervous symptoms (to be described later) are for a time held in abeyance. In his report Watson says, "To the profuse blood letting, pushed to the physiological limit, I attribute the disappearance of the nervous symptoms, by the removal with the blood of a great amount of toxin of the disease."

Urticariform swellings of the skin, the so-called plaques, now make their appearance upon different parts of the body. According to different writers they appear upon the croup, neck, shoulders, chest and abdomen, but I have observed them also upon the sides of the body and between the thighs (Figs. 1 and 2). These elevations are sharply defined and may be circular, ovoid, or irregular in form, with considerable variation in their dimensions. They may be remarkably transitory, appearing in the morning and disappearing before night; although in most instances they persist for some time before they finally disappear. Lingard considers that they are due to angio-neurotic edema, produced by the casual parasite or its developmental form in the papillary layer of the skin and that the toxin elaborated by the parasite causes capillary dilatation, with localized increased production of lymph. Farmer states that plaques "can be made to appear at any time after they have once shown themselves * * * by giving the animal a little more exercise than usual. After twenty-four hours plaques appeared. Long railway journeys and debilitating causes will bring out an eruption of plaques." He further states that he "took great care when purchasing stallions in Spain to give the animal a good deal of galloping, and examining the following day."

Coincident perhaps with the appearance of plaques, there may be observed peculiarities in the animal's gait and attitude while at rest. Slight dragging of one or both hind feet and "knuckling" of the fetlock joints may be apparent. When forced to move faster than a walk, inco-ordination is very evident and the animal may trot along in what has been referred to as "dog fashion," or perhaps stumble and fall to the ground. While standing, the hind feet may be lifted alternately, with considerable flexion of the hock. After the foot has been raised for a moment or so, it is cautiously lowered, weight thrown upon it and the opposite foot raised with a perceptible jerk accompanied by more or less abduction. Paralysis of the lips, ears, and eyelids may be in evidence and emaciation becomes very marked, especially in the posterior half of the body, so that the

haunches, ribs and spine become very prominent. The mucous membrane lining the vulva and vagina which in the earlier stages of the disease exhibited a congested appearance, now assumes a yellowish color, and is thrown into folds. The white spots already described as appearing upon the genitals, may coalesce and extend beyond the limits of the original lesions, and extensive depigmentation may even take place in the absence of any pre-existing lesion, as evidenced by diffused white areas upon the sheath, scrotum, perineal region, anus, mammae, and around the eyes, lips and nostrils. Infection of the lymphatic system may now manifest itself by the formation of abscesses in the different glands. In each of the two most typical cases that I have ever seen, there was a pronounced nasal discharge accompanied by enlargement of the submaxillary lymphatic glands.

The third stage of the disease in both sexes is marked by increasing depletion and paralysis. When down, the patient has great difficulty in regaining its feet and, if successful, sways from side to side in the effort to maintain an equilibrium. Finally, the animal is unable to rise and bedsores may form upon the most exposed parts of its body. Death due to general paralysis, pneumonia or septicemia, closes the scene.

While the foregoing symptoms have been mentioned in what is supposed to be their proper sequence in a typical case of dourine, it should be borne in mind that the stages as laid down are not arbitrary, and may overlap, or even be reversed. Thus, incoordination and slight paralysis are often the first symptoms observed, to be followed later by those described as usually apparent during the initial stage of the affection. It is also important to realize that the symptoms may differ considerably, depending upon the susceptibility of the individual, the environment and the virulence of the infection.

Past experiences in dealing with outbreaks of dourine in the United States and Canada have clearly demonstrated the fact that while typical cases are occasionally seen, the atypic form of the disease predominates and, to quote Dr. Rutherford, "gen-

erally following a chronic, insidious and semi-latent course, a most serious menace to the horse-breeding industry."

As the usual time allotted for the reading of papers has already been exceeded, it will be impossible to take up the differential diagnosis and post-mortem findings of this disease.

I have endeavored to give a résumé of the established facts, as well as a few of the more recent conclusions that have been arrived at relative to dourine.

The photos I submit with this paper illustrate a case met with while State Veterinarian of South Dakota, and were secured on September 21, 1903, the day upon which the mare was destroyed.

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BOVINE TUBERCULOSIS INVESTIGATIONS AT THE UNIVERSITY OF CALIFORNIA FARM.*

BY C. M. HARING, D.V.M., BERKELEY, CAL.

The preliminary results of certain investigations concerning bovine tuberculosis at the University of California Farm were presented at the Chicago meeting of this association in a paper by Haring, Sawyer, and Morgan.¹ During the past year these experiments have been continued,^{2, 17} the purpose of this paper being to present further observations in connection with this work.

FURTHER RESULTS IN THE TESTING OF VON BEHRING'S BOVOVACCINE.

In the paper previously mentioned results were given from a two years' test of von Behring's method of immunizing calves to tuberculosis. In that paper our conclusion was that under California conditions von Behring's bovovaccine fails to protect calves until two and a half years of age. Some immunity, however, seemed to be produced.

Tuberculin tests and the slaughter of immunized and control animals from the experimental herd during the past year have given some interesting data. I will briefly outline this experimental work to date.

In the spring of 1907 *forty-five* calves were secured for experimental purposes. *Twenty-two* of these were treated with bovovaccine after the manner of von Behring and *twenty-three* were kept as controls. Twenty-seven of the calves came from a dairy of thirty cows which proved to be non-reacting by two

* Presented at the Forty-seventh Annual Convention of the American Veterinary Medical Association, San Francisco, September, 1910.

FOOT NOTE.—The small numbers refer to references at the end of this article.

tuberculin tests. Eighteen came from a dairy of eighty-four cows, sixteen of which reacted to tuberculin. Of the twenty-seven calves from the non-reacting dairy herd thirteen were treated with bovovaccine, and of the eighteen from the eighty-four cow dairy nine were so treated. Great care was taken to follow the method and technic prescribed by von Behring. Precautions were taken to eliminate the error of vaccinating calves already infected and during the first year the calves were reared with every possible precaution against tuberculous infection. At the end of eight months all the calves were tested with tuberculin and none reacted. A more detailed description of the selection and rearing of the experimental animals was given in my previous papers.^{1, 17}

After having satisfied ourselves that the band was free from tuberculosis, the forty-five animals were subjected to infection by placing in their pasture five reacting cattle that were apparently in an advanced stage of tuberculosis. These were associated with the calves in a twenty-acre pasture and in a corral. Within six months these five cattle had all died of tuberculosis, as proved by autopsy in each case. During the winter of 1909 no tuberculous animals were with the young cattle. They were fed under an open shed during rainy weather. Other than this, they lived out of doors. In March, 1909, ten more reacting dairy cows were placed in the corral and pasture with the young cattle. Three of these cows were proved to have open tuberculosis by infecting guinea pigs from their feces and all were eventually found to be tuberculous by autopsy.

For economic reasons it has been necessary to slaughter all of the experimental animals whether they reacted or not. Twenty-four of the forty-five experimental calves have been found tuberculous. None of the others had tuberculous lesions. *Of the twenty-two vaccinated cattle ten were tuberculous; six of these came originally from the non-reacting dairy herd and four from the reacting dairy. Of the twenty-three non-vaccinated cattle, fourteen were tuberculous; seven came originally from the non-reacting dairy herd, and seven came from the reacting dairy herd.*

TABLE I.
Showing the age at vaccination, and source of each tubercular animal, and the extent of its lesions.

NUMBER OF THE ANIMAL.	ORIGINAL SOURCE OF THE CALF.	AGE AT FIRST VACCINATION.	DATE OF SLAUGHTER.	LOCATION OF TUBERCULAR LESIONS FOUND ON AUTOPSY.
11.....	From a tubercular herd.	10 weeks.....	Aug. 25, 1909.	Liver and portal lymph glands.
12.....	Non-tubercular herd.	14 weeks.....	Aug. 25, 1909.	Right precurral lymph gland.
26.....	Tubercular herd.....	12 weeks.....	Aug. 25, 1909.	Mesenteric lymph glands.
29.....	Non-tubercular herd.....	20 weeks.....	Aug. 25, 1909.	Mesenteric lymph glands.
48.....	Tubercular herd.....	12 weeks.....	Jan. 29, 1910.	Posterior mediastinal gland.
15.....	Tubercular herd.....	16 weeks.....	Jan. 29, 1910.	Lungs and mediastinal glands.
33.....	Non-tubercular herd.....	6 weeks.....	Jan. 29, 1910.	Lungs, bronchial and mesenteric glands.
32.....	Non-tubercular herd.....	4 weeks.....	Jan. 29, 1910.	Posterior mediastinal gland.
21.....	Non-tubercular herd.....	16 weeks.....	April 25, 1910.	Retro-pharyngeal lymph gland.
22.....	Non-tubercular herd.....	5 weeks.....	April 25, 1910.	Lungs, pharyngeal and mediastinal glands.
17.....	Non-tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Lungs, pleura, mediastinal glands.
23.....	Tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Cervical and thoracic lymph gland.
27.....	Tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Cervical and mediastinal lymph gland.
36.....	Non-tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Heaptic and mesenteric lymph gland.
38.....	Non-tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Bronchial, mediastinal and portal gland.
43*.....	Non-tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Mediastinal lymph glands.
44.....	Tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Lungs, bronchials, and mediastinal and portal glands.
51.....	Non-tubercular herd.....	Not vaccinated..	Aug. 25, 1909.	Generalized tuberculosis.
39.....	Tubercular herd.....	Not vaccinated..	Jan. 29, 1910.	Bronchial, mediastinal and portal glands.
47.....	Tubercular herd.....	Not vaccinated..	Jan. 29, 1910.	Lungs and bronchials, mediastina, and mesenteric glands.
28.....	Tubercular herd.....	Not vaccinated..	Jan. 29, 1910.	Posterior mediastinal gland.
40.....	Non-tubercular herd.....	Not vaccinated..	Jan. 29, 1910.	Mesenteric gland.
31.....	Non-tubercular herd.....	Not vaccinated..	Jan. 29, 1910.	Bronchial glands.
35*.....	Tubercular herd.....	Not vaccinated..	April 18, 1910.	Lungs, liver and associated lymph glands.

*This animal was the one killed as a demonstration at the meeting of the Medical Milk Commissions of California, at the University Farm.

It has been necessary, for economic reasons, to dispose of some of the fattest non-reacting, vaccinated cattle. In these, no tubercular lesions were found by the federal inspectors.

It would seem from these preliminary findings that von Behring's Bovovaccine fails to confer on calves a degree of immunity sufficient to absolutely protect them against infection until $2\frac{1}{2}$ years of age, when associated with tubercular cattle on pasture and in corrals. However, this does not contradict evidence that bovovaccinated calves have for a time, an increased power of resistance to tuberculosis.

Table I. shows the origin, age at vaccination, date of slaughter and lesions, if any, of the slaughtered vaccinated animals and of the non-vaccinated animals. A study of this table will show that of the twelve animals that reacted to tuberculin and were killed previous to September 1, 1909, the proportion of tuberculous vaccinated calves to tuberculous *non*-vaccinated calves was 1:2. Or, in other words, if one dare draw a conclusion from such a limited number of cases, the amount of protection afforded by the vaccine was 50 per cent. The table shows that since September 1, 1909, twelve more of the experimental animals have proven tuberculous on autopsy. Six of these had been vaccinated and six had not; that is, the proportion of tuberculous vaccinated to tuberculous non-vaccinated was exactly 1:1. It is apparent, then, that very little of the immunity conferred by the bovovaccine persisted after two years.

Bischoff and Company have recently written me that if a third injection had been made when the animals were about a year old their immunity would doubtless have been increased sufficiently to protect them from infection. We have reason to believe that this would have been the case. However, the purpose of this experiment was to test bovovaccine under California conditions. We have followed directions, and those directions did not include an injection of a third dose at the end of one year.

I realize that it is unwise to draw sweeping conclusions from the results on twenty-four animals, but the data is of value when considered in connection with similar tests^{3, 4}, which have been

made in this and other countries. It justifies the preliminary conclusion given in our previous paper, and, in addition, the conclusion that after the third year very little, if any, of the acquired immunity remains.

FURTHER OBSERVATIONS ON THE SPREAD OF BOVINE TUBERCULOSIS UNDER OUTDOOR CONDITIONS.

No doubt outdoor conditions have a very beneficial effect on cows already tuberculous. We observed such an instance. Nine emaciated reacting dairy cows were taken from a dairy and dried up. In a short time one died of tuberculosis. The others at once improved in flesh although their ration was changed from a balanced one of hay and grain to one of hay only. Four of the nine ceased to react. The fact that they ceased to react was not because the lesions were healed, for we were able to infect guinea pigs from the feces of three of these cows and eventually the nine cows were all found to be tuberculous on autopsy. It may be their failure to react was due to the fact that they had been tested four months previous.

In exposing the bovovaccinated calves and their controls to infection, the association and infection occurred entirely out of doors. This was fully described in the preliminary report of these investigations. The continued spread of the disease in the experimental herd during the past year strengthens our contention that a strictly outdoor environment will not prevent the rapid spread of tuberculosis among young susceptible cattle. Dairy cows that have been in infected dairies and survived repeated exposures to the disease are frequently observed by veterinarians when tuberculin testing. We had two animals of this type in the experimental herd for six months. One of these I know to have been for seven years in a dairy showing over 50 per cent. of reactors. It is probable she had a high natural resistance to tuberculosis. No lesions were found in either of these two cows in autopsy.

Dr. Rutherford⁵, in his discussion of our paper at the Chicago meeting, pointed out that the fact that in California and in some

other places tuberculosis *does* spread under outdoor conditions, must remind us of the differences that exist in the virulence of different strains of tuberculosis.

Dr. Baker⁶ in his paper in the proceedings of the sixth international Congress, shows that there has been a rapid increase during the past ten years in the proportion of tuberculous animals received at the abattoirs from certain ranges in California and he suggests that an exceedingly virulent type of tuberculosis is being bred here.

In selecting tuberculous cows for our infection experiments, those used the first year were from a beef herd living under strictly range conditions in the tules along the Sacramento river. It is possible we introduced a very virulent form of tuberculosis by taking these range animals.

THE EFFECTS OF INTRADERMAL, CUTI AND OPHTHALMIC TESTS UPON THE REACTION TO A SUBSEQUENT SUBCUTANEOUS INJECTION OF TUBERCULIN.

Enough work has been done in testing cattle by the cuti reaction of von Pierquet^{8, 9, 18} and by the ophthalmic reaction of Calmette^{10, 11} to show that these methods are of limited value in the diagnosis of tuberculosis in cattle. The intradermal method of Moussu and Mantoux¹⁴, however, seems more promising. The observations of Ward and Baker¹⁵ indicate that it rivals the accuracy of the subcutaneous injection. It is possible that the simultaneous use of some or all of these tests along lines of associated reactions advocated by Lignares¹⁶ will greatly increase the accuracy of our present methods of diagnosis.

With the object of determining the combined effects of the intradermal, the cuti, and the ophthalmic tests upon a subsequent test by the subcutaneous method, the following experiment was undertaken.

Eight dairy cows which, upon physical examination appeared to be tuberculous, were purchased and subjected to the Moussu and Mantoux¹⁴ intra-dermal test as performed by Ward and

TABLE II.

TUBERCULOSIS LESIONS AT AUTOPSY, AUG. 31.									
AUGUST 18.	AUGUST 22.		AUGUST 25.		Physical condition.		Other Lesions.		
Moussu's Intra-Dermal Test. I.c.c. O. T. tuberculin (original) dilution No. 5.	Von Pirquet's Cuti Test. I.c.c. O. T. tuberculin O. T. (bovine).	Calmette's Ophthalmic Test. 1% Tuberculin O. T. (human).	Subcutaneous Test. 2 <i>c.c.</i> B. A. I. Tuberculin.						
I. Swelling 2x2 cm. hard and round.	Negative.	Negative.							
II. Swelling 5x3 cm. hard inflamed.	Negative.	Indurated area 1 cm.	Rise of temp. Maximum temp. 105.4	Emaciated. Dyspnea and cough when exercised.	Poor. Abscess under jaw.				
III. 2x2 cm. hard.	Negative.	Negative.	Rise of temp. Maximum temp. 104.6	Emaciated. Dyspnea from enlarged retropharyngeal glands.	Fair. Cough. Purulent nasal exudate.				
IV. 5x3 cm. hard.		Indurated area 1 cm.	Rise of temp. Maximum temp. 106.2		Poor. Coughs when exercised.				
V. 1x1 cm. hard.	Negative.	Negative.	Rise of temp. Maximum temp. 103.6						
VI. Negative. Only a trace of swelling.	Negative.	Negative.	Rise of temp. Maximum temp. 105.4	Emaciated. Very weak. Coughs.					
VII. 2x2 cm. hard.	Negative.	Negative.	Rise of temp. Maximum temp. 105.4	Poor. Coughs. Labored breathing.					
VIII. 10x4 cm. hard black.	Negative.	Negative.	Rise of temp. Maximum temp. 106.8	Fair. Dyspnea and cough when exercised.					
XI. Control	Negative.	Negative.	No rise.	Calf 3 months.	No lesion s.				

Baker.¹⁵ A four-months-old calf, presumably non-tuberculous, was likewise injected as a control.

As indicated in Table II., seven of the eight cows reacted. The reaction swellings varied from one to ten centimeters in size and persisted from five to fourteen days. Ninety hours after the intradermal injection, a simultaneous cuti and ophthalmic test was made following the methods of von Detre¹⁸ and Calmette¹⁰, respectively. Only two of the eight cows reacted to the cuti tests and one of these also had a watering of the eye and slight injection of the conjunctival blood vessels which might have been a reaction to the tuberculin dropped in the eye. One of the other cows had a slight watering of the eye. The calf used as a control showed no reaction. Seven days after the intradermal injection previously mentioned, and three days after the von Pierquet and Calmette tests, the cows were given the regulation subcutaneous tuberculin test, using 2 c.c. B.A.I. tuberculin per animal. They all reacted to the test. Six days later, on August 31st, all but one, which was saved for the A. V. M. A. clinic, were killed and found to be extensively tuberculous. (The animal reserved for the A. V. M. A. clinic also proved to have extensive tuberculous lesions.)

The data is given in Table II. It would appear from this table that the intradermal test has comparatively little nullifying effect on a retest by the subcutaneous method after seven days.

The cuti and ophthalmic tests need little comment. The numerous negative results simply add confirmatory evidence to the findings of Mohler and Washburn,¹³ White¹¹ and others.¹² These do not seem to be of much value in testing cattle.

In addition to the persons acknowledged in my previous reports I am indebted to George S. Baker, D.V.S., Veterinary Inspector of the Bureau of Animal Industry, and to F. V. Twining of the Cutter Laboratory, Berkeley, for valuable assistance.

SUMMARY.

(1) Some immunity was produced by the use of von Behring's "Bovovaccine," two doses of 1 and 5 I. E. respectively be-

ing used. This immunity did not remain to any appreciable extent after the third year.

(2) Further observations on the spread of tuberculosis among cattle kept entirely out of doors confirms our previous conclusion that the keeping of cattle under strictly outdoor conditions will not prevent the rapid spread of the disease.

(3) In 100 per cent. of eight cases the combined intra-dermal, cuti and ophthalmic tests did not prevent a reaction seven days later to the subcutaneous injection of 2 c.c. of B. A. I. tuberculin.

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The following verses were composed by a Mr. Strothers and read by Dr. O'Connell at a banquet given to Dr. J. A. McKinnon, veterinarian at the Land Transportation, Manila, P. I., August 10, 1910, in recognition of his able and faithful services and good fellowship, extending over a period of eight years as veterinarian to the Quartermaster's Department:

OUR FRIEND THE VETERINARIAN.

From Butte City in Montana
To the Philippines he came,
In the land of sweet manana
To woo the fickle Dame.
He came not with martial stride,
He made no saber rattle.
He came to pitch his tent beside
And fight; a long-drawn battle.

In horse's pain, he met his foe!
Their groans his battle cry!
His shots were aimed to kill their
woe,
Or soothe when Death was nigh.
Of't did we meet him with the dawn,
His voice with battle ringing;
His look would tell some horse had
gone
Or still to earth was clinging.

Of't did we meet him with the gloam
From some long fight returning,
Then knew that he had driven home
A telling blow of learning.
He answered well the horse's call
For help; in misery's hour,
He never tired of doing all
That lay within his power.

To make their heavy burden light,
To heal a wounded limb,
Or chase away the shades of night,
When sight was growing dim.
How well the suffering horses knew
By touch, the master hand—
Like cool refreshment of the dew,
Upon a barren land.

Adown our thorny path of years,
He came with healing balm,
A strong ship in a storm of tears,
A fair wind in a calm.
He ever played his true and kind
And won as kindness can,
Pleasant good nature, where behind,
Walked Dr. McK., the man.

And now his friends are gathered
here
With hoarded Friendship's gold,
A parting song, a ringing cheer,
A farewell to unfold.
Though at the parting of the ways,
We sing a sad refrain—
We hold the light of other days,
He will come back again.

MODERN OBSTETRICS OF ANIMALS.*

By J. H. BLATTENBURG, LIMA, OHIO.

Obstetrics, that branch of surgery which deals with the management of pregnancy and labor, is not so correctly applied with respect to animals. To follow out in technical speech or term, "Tokology" (a birth) (to bring forth) might be more applicable to this subject.

The term "obstetrics" should not be limited to the act of parturition, one of the most important of all the animal functions, but includes the essential mechanical portion consisting of means devised to overcome the obstacles that may impede the birth of the young animal, and a knowledge of the functions and conditions connected with conception, generation and the parturient state.

Aside from having the benefit of experience, a successful obstetrician in the veterinary field should possess a thorough knowledge of anatomy and physiology of the generative organs as to the regions situated in the different animals; also should possess great tact in regard to manipulation, natural mechanical skill, readiness in device and patience that he may handle his subject in a humane manner; having the quality of persistence, ever retaining that heavenly disposition, for he is often sorely tried. Yea, verily.

The pelvis is a large, symmetrical, bony cavity, assisted by its ligamentous walls containing, sustaining and protecting a portion of the soft and delicate parts of the genito-urinary tract and forming the passage through which nature intends the foetus to travel in its being born to the outside world. At the anterior circumference or abdominal opening of this pelvis or in this

* Presented to the American Veterinary Medical Association, at its Forty-seventh Annual Convention, San Francisco, September, 1910.

cavity is where usually the foetus presents itself for expulsion, either in the natural or pathological position following that period which it has necessarily undergone for its development.

It is here the veterinary obstetrician encounters most of his obstacles to be overcome. It is much less frequent his attentions are called to interrupted pregnancy or the stage when the foetus has not attained sufficient development to live external to the mother.

PRESENTATIONS.—Those parts of the foetus which present themselves at the pelvic inlet which are met by the hand of the obstetrist, who should be sufficiently able to designate and acquaint himself positively by touch alone the extremely variable presentations of the foetus, as in Holy Writ—"Seeing is believing but feeling is the naked truth."

Is it possible that some member of this association is not present due to a retainment on an anticipated case of parturition in some of the lower animals such as is customary with the skilled physician for the higher order of animals who piloted every one of us safely into the world?

In sacred history we learn that women were the only practitioners of this art among the Hebrews and Egyptians (see Genesis xxxv., 17, and xxxviii., 28, and Exodus i., 15-20), and it is equally certain the Greeks and Romans confided this branch of medicine to women. Phanarete, the mother of Socrates, was a midwife. However, physicians of that day were not ignorant of midwifery, for Hippocrates refers to the necessity of turning the child in certain cases. Craniotomy was advocated in certain cases also. Plato explains the functions and mentions the duties undertaken by women employed in midwifery.

The lot of the veterinarian is not cast so frequently among cases of normal presentation, but more so to the dystocia; and how often not until the owner, his servant and neighbor, or the empiric have done considerable damage and caused the loss of valuable time. Cases of maternal dystocia most commonly dealt with are pelvic constriction, displacement altered relations of the uterus and morbid alterations of the maternal organs.

Of pelvic constriction, usually the results of fracture at some previous time, the reparative process causing a pelvic exostosis. These fractures are not uncommon with animals as the result of falls, crushing blows or other causes. Female animals, large or small, having sustained such injuries or previously had an obscure and protracted spell of lameness in either hind quarter, should not be employed for breeding purposes unless carefully examined by one competent to discover any alteration in the pelvic diameter. Tumors, such as fibroma, melanotic and cancerous, or even abscesses, may prove causes of dystocia, the surgical treatment of which may depend upon circumstances.

Dystocia due to changed relations of the uterus, most frequent of which found is torsion either partial, complete or multiple, this being not frequently known to the human pregnant female, may occur in all animals, particularly the cow, in which it has been most frequently observed. Hernia of the uterus is occasionally found.

Laceration of the abdominal walls occurs by being unable to support the gradually increasing strain thrown upon them by the heavy uterus.

Morbid alterations of the genital organs causing maternal dystocia such as tumors, their situation, mode of attachment and consistency, may make a great difference in the act of parturition.

Rigidity of the cervix uteri is most frequently met with in the cow and the goat and occasionally in the mare. Complete obliteration of the os uteri may occur between fecundation and parturition, and has been observed in the mare, cow and sheep.

Anomalies of the placenta, morbid adhesion between the foetus and uterus, stricture of the uterus by external bands, persistent hymen, vaginal and vulvular atresia or contraction, may also prove a source of maternal dystocia.

FœTAL DYSTOCIA.—This is much more numerous and more frequently met with, but not everyone presents a real serious obstacle to be overcome; some of the seemingly severe and difficult ones, by slight manipulative tact, are delivered without much

effort. But, oh! how often that apparently unyielding bunch of foetal distortion has tested the persistent staying qualities of a veterinarian and lost him his religion!

Foetal dystocia, so numerous and varied, require careful consideration on the part of the obstetrist, thus opening a wide field for investigation.

Aside from the distorted foetal conditions to patiently deal with, we have excess of volume of the foetus, anomalies and diseases of foetal membranes, abnormal quantity of the placental fluid, anomalies in the umbilical cord, diseases such as hydrocephalus, ascites, hydrothorax, emphysema, polysarcia, contraction, tumors, death, monstrosities and multiparity.

The greatest obstacles encountered in dystocia of those mentioned, maternal or foetal, a veterinarian encounters, are uterine torsion, requiring various methods such as abdominal taxis, vaginal taxis, rotation of the mother's body, gastro-hysterotomy, etc.; dead, tumified, distorted foetus, most requiring amputations, extra uterine gestation requiring gastro-hysterotomy or Cæsarian section.

Those more frequently met with are the great number of more or less complicated mal-presentations and positions which give rise to varying degrees of foetal dystocia, and to be successfully overcome, change of position must be effected as a rule. By moving the foetus itself, by repulsion, rotation and version; these movements are sometimes easy, at other times most difficult and may even be impossible. The most favorable attitude for attempting these movements in the large animal is in the standing position, hind quarters elevated, in which position these movements may be effected during intervals between pains, and by the hand alone a birth may be possible with little difficulty. Failure to accomplish the desired results with this method or the use of the instrument employed as a repeller, is where the subject is a powerful and irritable animal, with a long genital canal and deep uterus, uterine contractions so energetic that they fatigue and paralyze the arm and hand of the obstetrist. It is a waste of human energy as well as lowering the vitality of the

animal to continue this battling. Quietude, relaxation of all efforts on the part of the animal is only accomplished and overcome by a complete anaesthesia; and pressure upon the abdomen while in a recumbent position is overcome by elevating the hind quarters and body entirely free of the floor by means of rope and pulleys attached to fastenings about both hocks of animal at one end, the ceiling or some conveniently secure place above for the other attachment.

The gravity of the foetus and relaxation aiding abdominal expansion (for a veterinarian is an expansionist at difficult parturition if at no other time). The obstetrist can now place himself upon some object high enough to execute his maneuvers of repulsion, rotation, etc., as undisturbed as the workingman at his bench. Should the genital tract be hot and dry, pour in a mucilaginous lubricating fluid of flaxseed water or oil. Failing under these most favorable conditions, embryotomy must be resorted to. Elevating small animals is done with much less effort. An additional set of ropes and pulleys fastened in like manner above, to fasten on to foetus as needed, is of great benefit to multiply force, also from the mechanical means of extraction such as various cords, crochets or hooks, repellers and forceps; there are few appliances to be added. An instrument is made by Hans Hauptner, Berlin, Germany, whereby securing a foot or an extended leg by a chain loop, dividing the skin longitudinally, a blunt circular blade on a shaft is inserted beneath the skin at the incision. By winding up the chain on a transverse shaft the blade is forced along the leg until it reaches the body, the muscles laid bare allowing more free amputation and extraction of limb in large animals. The reduction in volume of the foetus by embryotomy is attained by no little danger to the parturient animal as well as the operator by the few sharp instruments employed in this part of the work.

It is said of a certain man known for truth and veracity fulfilling the requirements of the laws of Iowa as a veterinarian, also a graduate of a reputable college, that he will take a foetal dystocia of the larger animals, efforts having failed to rectify

all malpresentations (the axis of the foetus coinciding with uterus and pelvic canal) deliver this flexible distorted foal or calf by slow manipulative traction; he considering the pliability of the young body sufficiently yielding to the more firm parts of itself, can be extracted through the firm pelvic canal in this manner. What do you know about that?

Gastro-hysterotomy or Caesarean section, the removing the foetus from the mother by an incision through the abdominal and uterine walls, pretends to great antiquity, but earlier histories are probably of mythical origin. In the Middle Ages it was added to the Roman law with the intention to give force to the decretals of the Church which sought through the Caesarean section upon the dead to rescue the child for the rite of baptism before its life had become extinct. Some strange notion appears to have been attracted to this mode of delivery as among the old world people the person who had been born by means of the operation was esteemed remarkable and fortunate.

Until recent date Caesarean section was justly regarded as one of the most hazardous operations in surgery upon the human subject. With regard to saving the young in the larger size animals of the lower order the operation is not very favorable. There is no doubt that much of the great mortality which follows the operation is due to the circumstances amid which it is undertaken and not frequently resorted to until other means of delivery have failed; very frequently a dead foetus to begin with; occasionally a putrid foetus has already infected the mother.

The dystocia most likely demanding the operation are due usually to pelvic deformity, exostoses, intra-pelvic tumors, extra-uterine foetalation, irreducible uterine torsion and, frequently in the smaller animals, too large a foetus.

The obstetrician having come to the conclusion to operate should lose no time in doing so, owing to the vitality of the mother and the life of the young if still existing. With few exceptions the operation should be done under an anaesthesia and never attempted without observing sterilization as near as possible.

The success following gastro-hysterotomy on the larger animals is much less frequent than that following the operation upon the smaller animals owing to the size and bulk of subject of the former, as foetus and mother prevent to a certain extent following out the desired order of cleanliness and technique. In the smaller animals this form of delivery is performed very frequently, especially in the sow, which is known to have been operated upon successfully by individuals claiming no particular knowledge of veterinary science or having ever attended an institution of such, but simply having observed carefully the modus-operandi and cleanliness of one more scientifically skilled.

Accidents following parturition are rather diverse and not infrequently complicated, such as retention of the foetal envelopes in the uterus and consequences of the same, traumatic lesions, displacement or hernia of the internal genital organs, post-partum hemorrhage, etc.

Retention of the placenta requires being dealt with according to conditions and time having elapsed following parturition. Emmenagogues prove of little avail in assisting nature to expel the mass of foetal envelopes which, having fulfilled their purpose, are often found in a well advanced stage of decomposition. Nothing short of manual traction with the free use of water containing some antiseptic as warm as the hand can bear will accomplish the removal of the placenta.

Post-partum hemorrhage, so frequent and alarming in woman, is rather rare in the lower order of animals, but the mortality of cases occurring is placed very high. In combating the rapid depletion of the system under this condition, no time should be lost in first removing foetal membranes, then passing into the uterine cavity towels or sheets as a tampon) saturated with cold water, also cold water douches containing styptics. Internal styptics should be administered.

Prolapsus of the uterus or of the uterus and vagina, with complications such as rents or injuries from foreign bodies or the gnawing at this bleeding mass by other animals, and occa-

sionally the uterus is wounded or torn by bad management in parturition. In certain cases there may also exist prolapsus of the rectum and displacement or even inversion of the bladder.

In inversion of the uterus, if attended to sufficiently early by those who are competent, the number of recoveries are considerable. There is no other pathological condition under the head of the present subject in which the obstetrician can demonstrate his artful powers with greater tact. Having removed all foetal membranes and cleansing the parts as best he can under the circumstances, and all efforts failing to reduce this voluminous uterine tumor hanging in a heavy mass, the obstetrist battling against the severe straining of the animal, complete anaesthesia should be resorted to, the hind quarters elevated entirely free of the floor by attaching rope and pulleys to fastenings around the hocks; also to ceiling or convenient place above in which position reduction is made easy. A very convenient contrivance in case of inversion is a common large wooden bowl with holes around the edge for the assistants to grasp into; in the center or bottom a large opening or hole for the arm of the operator to pass through. Often this method will greatly expedite the operation.

Reduction of the inverted uterus having been accomplished, the obstetrist devises means for retaining the uterus in its place such as pessaries, sutures, bandages, etc. That which accomplishes the desired results with the least effort is the pessary, which may vary greatly with the resourceful veterinarian. Lesions during or after parturition regarded as traumatic, of a more or less serious character, are found occasionally as ruptures of the diaphragm, perineum, bladder, intestines, sacro-sciatic ligament, abdominal muscles, etc.

Maladies peculiar to the parturient or puerperal period are regarded as pathology of parturition, the most important of which being vaginitis, leucorrhœa, metritis, parturient fever and apoplexy, paraplegia, eclampsia, laminitis, and other minor conditions, all due save a few to infection from septic material.

To become efficient as a veterinary obstetrician in meeting the many obstacles so far presented, that which is most required is thoroughness and perseverance.

To follow out in close detail what would be regarded or covered by the title "Obstetrics in Animals" would severely test the endurance of the auditors to the subject now presented.

DR. H. E. BRECKENBAUMER, Veterinary Inspector, B. A. I., has been transferred from Mobridge, S. D., to Sioux City, Iowa.

THE HUDSON COUNTY VETERINARY PRACTITIONERS CLUB held its annual "social" on Thursday evening, January 26, in Jersey City. This year it took the form of a Beefsteak Dinner, and was very much enjoyed.

A NEW world's running record for two-year-olds was set at Juarez, Mexico, January 17, when Celisse, a two-year-old filly carrying 123 pounds, ran $3\frac{1}{2}$ furlongs in 0.39 $\frac{3}{5}$. This is three-fifths of a second faster than the best previous time made by A. J. Small and Donan in 1909 and by Royal Prince last year:—*Breeders' Gazette*.

RECEIPTS of horses and mules at the six leading live stock shipping centres of the West show that St. Louis is now far in the lead of all other cities in the number handled annually. In 1910 there were received at St. Louis 130,200 head, as compared with 83,439 at Chicago, 69,447 at Kansas City, 34,000 at Fort Worth, 29,697 at Omaha and 28,688 at St. Joseph. * * * —*New York Herald*.

THE MICHIGAN STATE VETERINARY MEDICAL ASSOCIATION will hold its twenty-ninth annual meeting in the Veterinary Building, Michigan Agricultural College, East Lansing, February 7 and 8. The program is rich in good things from the best representatives of the profession in the state. Among them will be the tuberculin test and autopsy, under the direction of Prof. R. P. Lyman, Dean of the Veterinary Division, M. A. C. A banquet and smoker will be held at the Hotel Wentworth, on the evening of the seventh. Every veterinarian in the state should be in attendance at this meeting.

UNIFORMITY IN DEGREES AND MATRICULATION REQUIREMENTS FOR VETERINARY COLLEGES.*

BY GEO. H. GLOVER, M.S., D.V.M., FORT COLLINS, COLO.

Regardless of religious prejudices begotten of early training or of firmly grounded convictions in church dogma later in life, or again in the absence of either, every one who "runs and reads" cannot fail to observe the unmistakable evidence of the divine hand directing the evolution of the species.

There is ample evidence that man has lived on this earth more than two million years. In his evolution he appears to have gained momentum. His achievements in the last half century have been unprecedented and are attributed more than anything else to an insatiable desire to know of nature's laws and profit by them.

The education of the race has been a tedious achievement and typifies the education of man as an individual, which begins at birth and ends only when his eyes have closed in death.

We are evolving in our chosen field of activity and we are destined to go on and on. The rapidity of our progress will be determined by the amount of energy and unselfish devotion we are willing to sacrifice to its cause. Veterinary Science has been taking such rapid strides forward of late that we at times seem almost bewildered and tempted to sit back, content in the belief that enough has been done for our generation. But growth is possible, relatively in the same ratio that we mix interest and energy in our struggle onward and upward. We do not always do as well as we know; self-interest blocks the way. Let us grapple with the problems affecting the welfare of our honored profession with vigor and unselfish determination, knowing that they must eventually be decided for the greatest good to the greatest number.

* Presented at the Forty-seventh Annual Convention of the American Veterinary Medical Association, San Francisco, September, 1910.

In the matter of uniformity of degrees granted by our veterinary colleges, it is a sad commentary upon the usefulness of this association if it refuses to take some decisive action in the near future to correct the existing absurdity. While this multiplicity of degrees, all meaning the same thing, and given by colleges of uniform rank is wrong and should be corrected, yet I would not maintain that this matter is as vital to the welfare of veterinary education in America as some others. Where the degree of Veterinary Surgeon (V.S.) is given, the assumption is that this is intended as a doctorate degree, although the title does not indicate it. Besides, it is presumed that the recipient lays some claim at being a physician as well as a surgeon. Another school is granting the degree of Doctor of Veterinary Medicine (D.V.M.), and this is objectionable for the same reason that, while medicine may in its larger sense include surgery, in reality each branch has its specialists and the degree conferred should not emphasize one at the expense of the other.

Still another school is granting the degree of "Doctor of Comparative Medicine" (M.D.C.), and personally I like this arrangement, but obviously where there is such a multiplicity of cognomens, and such an array of titles suffixed to names of those all in one class professionally, the average person glancing at this sign, for instance, from the street, would have no idea whether the person back of the sign was a physician, a Christian Scientist or a corn doctor.

The degree of "Doctor of Veterinary Science" (D.V.S.) would seem to be very satisfactory. The crux of the whole matter is that there seems to be no serious objection to any one of these degrees, but the public are wofully ignorant as to their import because there are so many of them, and honestly believe in many cases that they stand for different vocations or different degrees of educational attainment in veterinary art, or something they scarcely know what. It is confusing to the public, engenders discord in the ranks, casts unfavorable reflections upon the profession, and no doubt has an economic significance. This discrepancy came about in the most natural way—was in the nature

of things unavoidable and no one is to blame. It can be remedied without material loss or serious inconvenience, but this never will be done if left to the colleges themselves. The Department of Agriculture has, I assume, no special interest in the matter so long as the course of study is kept up to their standard.

It is the duty of this association to take the initiative. Personally I will explain that I received the degree of D.V.M. at Ames College and have the honor of being at the head of a veterinary college that confers the degree of D.V.S., yet I assure you that I am not so actuated by selfishness that I cannot perceive the greater good that would be derived by changing, and if a resolution were passed by this association, asking all the colleges to confer a certain degree, I should ask my Board of Control to make the change and purchase the necessary stone for printing diplomas. And this is all there would be to it. Those of us holding a degree extinct under the old regime would not be discredited, dishonored, or interfered with in any way unless we foolishly chose to make it so.

I wish to recommend for your consideration the appointing of a commission by this association, consisting of the deans or heads of all the veterinary colleges of America in good standing (co-operating with the committee of the Department of Agriculture) to consider this proposition and report to this association one year hence.

The question of advanced degree corresponding to the F.R.S.V.S. of Great Britain and Ireland, might appropriately be considered at the same time.

MATRICULATION REQUIREMENTS.--One year ago I presented a paper at the Associated Faculties meeting, in Chicago, and argued that the time had come in our evolution when matriculation requirements for veterinary colleges should be raised to a higher standard, unified, and entrance examinations taken out of the hands of the colleges themselves. It is said of the medical colleges of America that they are "the best and the worst in the world," and this difference is in the main due, as acknowledged, not to the efficiency or lack of it, with which the subjects in the

curriculum are taught, but to the widely divergent conditions under which students are accepted for the course, ranging all the way from seventh grade attainment to the baccalaureate degree.

The veterinary medical colleges have their professional confrères beaten in college entrance requirements on the whole, yet it must be admitted that this is the weakest place in our entire pedagogic regime. Our educational system in some respects smacks too much of commercialism. It is absurd to think of a boy leaving the seventh grade at fifteen and after ten or twenty years engaged in commercial pursuits, again take up college work and expect to master a profession in three years. He is not perforce basically equipped educationally to digest and properly assimilate the heavy educational diet placed before him. Thanks to the Department of Agriculture, for through their efforts largely the course of study has been strengthened, lengthened and regulated, night schools have been tabooed, the faculty requirements made more exacting, and all this in the interest of strengthening and beautifying the educational superstructure, *but leaving the foundation weak*. It is like building a house upon the sands.

This get-wise-quick idea when applied to a learned profession is utterly fallacious, and is inspired by the same commercial spirit which prompts a man to take a few months' apprenticeship in the trades that he may secure some advantage in securing a job and increase his wage. Education for its own sake in such cases does not appeal. We should stand more and more for higher education in Veterinary Science, and refuse to compromise with the restless spirit of the times which would seek to reach Utopia at a single bound, and succeeds only in helping the misguided devotee to a questionable artificer proficiency.

This idea of the "exclusively practical" is sweeping the country like an avalanche, is invading the industrial colleges, universities and common schools, and it is to be commended, but it has no rightful place in our professional schools.

Education is not a specific commodity to be purchased for a monetary consideration or in a prescribed length of time. Rather

it is a relative achievement and if directed along professional lines, can be attained in a high degree only by a thorough *basic training* and a determined and uninterrupted struggle ever after, burning the midnight oil, concentrating every effort for years and years—*this is getting an education.*

The real worth of an education is not attained if it be directed essentially either for the making of *life* or making a *living*. It should be so adjusted as to achieve both. I am inclined to think that we have been lending too much encouragement to the commercial advantages of a course in veterinary science, and in so doing have opened our doors, in many instances, to men wholly unprepared to do themselves or our institutions justice.

PRESENT CONDITIONS NOT SATISFACTORY.—To one not conversant with the conditions under which Class "A" veterinary colleges are rated, it is inconceivable how all of these colleges are giving practically a uniform course of study with a corps of instructors, in education and experience up to a high standard of efficiency, and yet some are matriculating students upon examination who are almost strangers to the grammar school, and others are requiring high school graduation. Why is veterinary education so different that preparedness is not considered equally essential?

For reasons which are self-evident, students in our primary schools, high schools and colleges, are classified and given their work according to scholarship, but in our veterinary colleges, we find students with college credits taking the same work in the freshman year along with those who have had no training beyond the grammar school and the school of experience. It is like trying to drive an ox and a standard-bred roadster in the same team.

WHAT IS THE REMEDY?—I believe this discrepancy in matriculation requirements to be the most vitally important problem in veterinary education to-day. I do not advocate any radical changes, but I do believe the time has come when we should at least make some move toward correcting this glaring inconsistency.

A few years ago, prominent educators awoke to the fact that the lack of educational standards in our school systems made the matter of grading students very unsatisfactory. This became so apparent that different states, and in some instances associations, organized for the purpose of fixing standards for schools and colleges. As an example, "The North Central Association of Colleges and Secondary Schools" is an organization of seventeen states, voluntary and devoted to the cause of bringing about a keener sympathy and a heartier co-operation between the colleges and the secondary schools. Uniform standards are essential in matters educational as well as in everything else. This association, like others organized for the same purpose, has served the object for which it was created, and it has practically fixed the matriculation as well as graduation requirements for the grammar schools, high schools and colleges, in this group of states.

UNIT COURSES.—The unit course system has come to stay and veterinary colleges may wisely adopt this system of unit credits. The unit course adopted by this association means a course covering an academic year that shall include in the aggregate not less than one hundred and twenty, sixty-minute hours of class-room work, two hours of laboratory work being equivalent to one hour of class-room work.

All accredited high schools are required to give fifteen units for graduation and all recognized colleges are obliged to require fifteen units from an accredited high school for its matriculants. Of these fifteen units, three units of English and two units of mathematics are required as constants. The fifteen units required of recognized colleges mean high school graduation, and while not definitely fixed are usually divided as follows:

Mathematics (constant)	2
English (constant)	3
History	2
Science, Chem.	1
Physics	1 2
Elective	6
	15

Electives may be chosen from the following: mathematics, 2; French, 3; German, 3; Spanish, 2; History, 2; English, 2; Science, 2; Drawing, 1; Psychology, $\frac{1}{2}$ or 1; Political Economy, $\frac{1}{2}$ or 1; Shop Work, 1; Agriculture, 1; Domestic Science, 1; and other electives offered are considered.

Were the veterinary colleges to seek recognition by this association on the same basis that other institutions of high learning are received, they could succeed only on condition that they require fifteen unit credits for matriculation.

It is very evident that most of our veterinary colleges, while they are recognized by the United States Department of Agriculture and the American Veterinary Medical Association, would be discredited by the North Central Association of Colleges and Secondary Schools, and solely on the grounds of matriculation requirements.

Gentlemen, veterinary education will never receive the respect and consideration that is its due until we make our conditions such as will warrant placing it on an equal with other higher institutions of learning. Age and practical experience do not count for unit credits in any educational system in the world.

The State of New York has a system of its own, and a uniform examination admits students to any of its colleges. Our highly respected Cornell University does not give entrance examinations. The veterinary colleges of Great Britain and Ireland are not allowed to admit students upon examinations given by those institutions themselves.

I wish to repeat with even more emphasis than I did one year ago: "The time has come when it is fitting and proper and I believe advisable and necessary for the American Veterinary Medical Association to take decisive action for the betterment of these conditions."

My recommendations respecting matriculation standards are that this Association and the United Veterinary Faculties of America take decisive action at this meeting and promulgate some plan looking to the enactment of reform in this phase of veterinary education under discussion. I wish to recommend

that after the year 1910 all veterinary colleges aspiring to recognition by this association shall require for matriculation either fifteen unit credits without an examination or five units with an examination. Further, that all entrance examinations be placed under the supervision of a committee of this association, working in conjunction with the committee from the United States Department of Agriculture. This would make our matriculation conditions very like those of Great Britain and Ireland.

Some such arrangement as this is entirely within the province of this association and the details could be perfected as the plan unfold. Our British confrères are well satisfied with their plan as it insures a high degree of efficiency in the student body and all colleges being on a common footing, there is avoided the tendency to rush to the college where entrance conditions are easy.

Gentlemen, it is now time in our evolution when this most glaring defect in our pedagogic regime should be seriously investigated. This inconsistency is fast becoming an absurdity.

THE FARM CAT.—The cat is a great blessing, a great necessity on the farm, declares the Dakota *Farmer*. She labors, like interest, when others are asleep. She is patient and, when mice and rats are a slim crop, she is happy with a repast of scraps, out of hand.

The ancient Egyptians worshipped puss, or rather tom, as a God, but on the Dakota prairies the place of the feline is not in the temples. Here she saves cereals rather than souls.

The superstitious think that when a black cat comes, it is a token of ill luck. Believe this not at all.

Our old black Tabby is a perfect diamond in carbon, because of her valorous deeds. Brother Rat and Mistress Mouse, in slyness, do both assail her loyal character, but the entire family would contribute to having her history penned in this way: The Humblest, but Truest Defender of the Home.—*Our Dumb Animals.*

THE SURGICAL RESTRAINT OF ANIMALS.*

BY GEORGE R. WHITE, M.D., D.V.S., NASHVILLE, TENN.

When invited by Dr. L. A. Merillat, Chairman of the Surgical Section, to address this meeting on the subject of "Surgical Restraint of Animals," I was at first somewhat constrained to suggest that this paper be eliminated from the program, and to ask to be excused from appearing on this occasion. However, after more mature consideration, the thought occurred to me that the "Surgical Restraint of Animals" is a subject which means as much to the practitioner of veterinary surgery as does anaesthesia to the practitioner of human surgery, and that there was a place—and a very important one at that—on the program for a paper of this character.

The importance of efficient restraint as a prerequisite to good animal surgery cannot be over emphasized. Surgical restraint—especially as applied to the larger of our domestic animals—is a problem which confronts us, and one which we are called upon to actually solve in a practical way, almost every day. Our present methods and appliances for surgical restraint are imperfect, and in many respects decidedly unsatisfactory. Until quite recently the methods themselves were even unsystematized, to say nothing of the haphazard arrangement of the various and sundry appliances used. And even at the present time, the methods of casting pertaining to special positions remain unclassified and in many respects are not illustrated or even described. The literature pertaining to, or attempting to describe the several special positions is meagre, and that literature which is available is indeed widely scattered. This dearth of literature on such an im-

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portant subject should not be allowed to exist very much longer. It is a reflection upon the American, and I can as truly and with as much emphasis say the European veterinary profession, to allow such a practical problem to remain unsolved in this age of twentieth century advancement. However, no one has yet either in this country or abroad, been able to see their way clear to attempt to furnish the profession with the necessary information. Let us hope that we will soon be furnished with more reliable literature on this all important subject.

Each species of our domestic animals are endowed with one or more means or weapons of defense. These must be reckoned with and overcome by effectual means of restraint. The animal must be rendered harmless, and at the same time the operative area must be made immovable and secure by the restraint method at hand. Of course the particular method employed depends largely upon the animal itself as well as the degree of restraint necessary. While we constantly find it necessary to employ methods of subjection and restraint in order to properly perform our duty as surgeons, we should always do so in as humane a manner as possible. Humanitarian treatment applies here as well as elsewhere in the practice of veterinary science. We should never take advantage of an animal when confined, in order to torture or inflict unnecessary pain of any kind.

Not only does the problem of surgical restraint concern the surgeon himself, but his client and patient are directly interested to a well-marked degree. The surgeon owes it to his client, his patient and to himself to become proficient in properly and securely restraining animals for examination and operation. Without efficient restraint the surgeon is in constant danger of great bodily harm; the animal is in danger of self-inflicted injuries as a result of its own efforts at resistance, thereby causing the owner financial loss which could and should have been avoided by proper methods of procedure. There is no disputing the fact that the veterinary colleges themselves are largely responsible for the haphazard manner in which restraint methods are used by the great majority of veterinarians of this country. The col-

leges take an apparent delight in turning out men unequipped in this important branch of what should be a part of their college course. If the subject is taught at all, in the majority of the colleges it is done in a half-hearted, unconcerned way which makes little or no impression on the student. This mode of teaching, or I may properly term it criminal neglect, is done in spite of the fact that nine chances out of ten this very student body will be confronted with the problem of surgical restraint before the ink gets dry on their diplomas. The method of restraint used and the manner in which he uses it, will in many instances reflect more upon the surgeon's ability than the dexterity or thoroughness of the operation itself. Many reputations have been made by proper restraint methods, and on the other hand, equally as many reputations have been lost by ignorance of this subject. Each operator should select his favorite method—the one or ones which most appeal to his fancy—and by practice become proficient in the skillful use of the same. The time spent will be well invested, and I assure you that you will soon be repaid tenfold.

In order to cast and secure an animal properly and successfully, the operator should possess a level head associated with plenty of courage and confidence. He should retain his equilibrium in spite of any untoward accident or emergency which may chance to take place. Self confidence and good judgment are both valuable assets in performing work of this character. The surgeon should get control and remain in control from the time the twitch is placed upon the animal preparatory to applying the hobbles or casting harness until the animal is again on its feet. Do not forget or underestimate the various dangers and hazards which may take place. However, do not allow yourself to become over absorbed in these possibilities to the extent of losing your head. This would there and then render you incompetent to proceed. Retain your mental faculties sufficiently to continue with dispatch and skill, thereby doing justice to the patient and honestly earning your fee.

As soon as the surgeon has examined the patient and diagnosed the case—provided the case be one of a surgical nature, the problem of subjection or restraint confronts him. It may vary anywhere from partial restraint to restraint in its most complete and secure form. The restraint method or appliance necessary may vary all the way from the simplest form of twitch to the complex hydraulic operating table. The degree of restraint will depend upon:

- I. The temperament of the patient.
- II. Position desired or required for the particular operation now to be undertaken.
- III. Physical condition and dexterity of the surgeon.
- IV. Facilities for operation at hand, viz.: (a) Number and qualification of the assistants. (b) Available surgical restraint appliances. (c) Character of the casting surroundings. (d) Value, age and size of the animal.

Surgical restraint methods begin with subjection by means of twitches, gags, war bridles and barnacles. These appliances are used to divert the animals' attention while the hobbles or casting harness are being applied. Many different appliances are used for restraint of the horse in the standing posture. These vary all the way from the simple knee strap for restraining one fore foot to the hippo-lasso, and the various forms of stocks for restraining all four feet.

When deciding whether or not it is necessary to cast and secure a horse for operation or other purpose, the surgeon should carefully consider the temperament, the physical condition of the animal, the length of the time restraint will be required, the painfulness and character of the operation and last, but by no means least, the physical ability and qualification of the operator. As a general proposition, it is always advisable to cast and secure an animal for painful or long continued surgical operations. Without exception, nervous, highly bred and vicious animals should be cast and securely confined. When it has been finally decided

to cast the animal, we should, first of all, carefully survey the surroundings and select the most satisfactory location. The ideal operating mat or mattress is a plot of green grass grown upon smooth ground. Select the place—be it stall, hallway or operating room—where the most room is available. Then a proper bed must be prepared. This may be done by the use of tan bark, wood shavings, straw, hay, excelsior, sawdust, etc., or a specially constructed mattress may be used.

The next problem that confronts us is which particular hobble or casting harness it is advisable to use in this particular case? We have the hobble casting harness, and operating table from which to make our selection. Each of these have their advantages as well as their disadvantages. The method employed must depend largely upon the circumstances and surroundings encountered in each individual case. The temperament, size, strength, age and conformation of the animal must each receive due consideration. Then the location of the field of operation, the length of time required to operate, number and skill of the assistants, value of the animal, and means of restraint available, are all to be considered. To avoid rupture or dislocation of important internal abdominal organs, it is best to prepare the patient before casting. This is done by withholding water and food for from twelve to twenty-four hours. When we once undertake the task of casting and confining the animal, it should be completed with dispatch. Do it quickly, avoid accident, unless same is unavoidable. And, above all things else, for the personal safety and protection of the operator and the welfare of the animal, the restraint should be secure. The dangers encountered in performing work of this character are legion. The operator is often kicked, struck or bitten while applying and adjusting the casting apparatus. The animal may receive halter burns, lacerations and abrasions of different kinds. Rupture of muscles and tendons sometimes take place. Fractures of the vertebrae and other bones are by no means infrequent. Some patients present radial paralysis as a sequelæ of casting, while others become exhausted and never rise after being released.

HOBBLES.

Hobbles as a means of restraint have the advantage over any other method in so far as they are light, portable, strong and convenient. They can be quickly applied and the animal cast and secured with few assistants and little ceremony. An animal can also be released promptly and allowed to regain its feet. The disadvantages of hobbles and the impossibility of securely restraining the patient, liability of accident, to patient, and inability to fix the legs in special positions for operations where position plays an important role. There are numerous styles and kinds of hobbles; some are, of course, better and more satisfactory than others. In making a selection, be sure and not make the mistake of sacrificing strength for appearance. Be sure the hobbles you use are well made and strong.

DIRECTIONS FOR CASTING AND CONFINING A HORSE WITH HOBBLES.

First—Select a suitable place and prepare a soft bed for casting.

Second—Place the animal in proper position.

Third—Apply the twitch.

Fourth—Apply the operating hood.

Fifth—Apply the hobbles.

Sixth—Detail assistants to their proper positions and instruct them to obey orders.

Seventh—Cast the animal.

Eighth—Secure the animal.

CASTING HARNESS.

Casting and restraining the horse by use of harness, ropes and other methods, aside from hobbles and operating tables, will surely test the skill and dexterity of the surgeon in the efficiency of his restraint technique. It is by means of the various designs of securing harness and ropes that most of the special positions of the animal are obtained. Special positions are necessary in order to perform certain surgical operations. Restraint by use

of casting harness and ropes means restraint in its broadest sense. With these special appliances we are enabled to render the animals absolutely motionless, and at the same time harmless. When thus properly restrained, the animal is entirely at our mercy and we can with safety and confidence proceed with whatever operation we wish to undertake.

OPERATING TABLES.

As a means of restraint in the recumbent posture, the operating table occupies an unique as well as an important position; however, the operating table as with the stocks, has its advocates as well as its adversaries. Many prominent surgeons of this and other countries are flattering in their praise of the table, while other practitioners of equal prominence and qualifications are caustic in their condemnation of the operating table.

Many have condemned all tables in general without subjecting a single one of them to a fair and impartial trial. Others have condemned all tables because one single table in their hands chanced to be defective in workmanship or design, hence unsatisfactory. Some practitioners have even filed severe indictments against operating tables because they are stationary and not sufficiently light or small to be carried in their instrument grip from call to call. Another objection raised by some is the inconvenience or impossibility of putting some fractious or nervous animals on the table, or because it cannot be used under any and all circumstances and conditions. They even dislike it because it occupies too much space in the operating room, and requires two or more assistants to handle a large and strong horse. However, after considering all phases of the operating table proposition, I have no hesitancy in saying that the table is a valuable adjunct to our surgical restraint equipment, and fills a gap which is distinctly its own. In conclusion, I would like very much to impress the importance of the surgical restraint upon the active practitioners present. Also to insist upon its receiving more and better consideration in our various veterinary educational institutions. It is practical, it is necessary, it is worthy of your attention.

REPORT OF AN OUTBREAK OF HAEMORRHAGIC SEPTICAEMIA IN SHEEP.*

BY S. H. WARD AND W. L. BEEBE, ST. PAUL, MINN.

The term haemorrhagic septicaemia is applied to several different affections regardless of the causative factor, but as applied by the authors in this paper it means an infectious disease of sheep, either acute or chronic, caused by the *Bact. ovisepticus*.

Lignieres seems to have been the first to demonstrate that this disease was caused by an organism which belongs to the haemorrhagic septicaemia group which he later terms *Pasteurella*. Although he first discovered the cause of this malady in the Argentine Republic, he was able later to demonstrate its existence in several parts of France. Since that time it has been found in many different parts of Europe.

The outbreak of haemorrhagic septicaemia that was investigated by the writers occurred in a flock of 2,700 sheep that were shipped from Cle Elum, Washington, to Chicago. They were loaded in Cle Elum on August 3, and unloaded and fed at Missoula, Montana, on August 4. At that time three of them were found dead. They were reloaded the following morning, August 5th, and hauled to Glendive, Montana, arriving August 7th, and again unloaded, fed and watered. At that time 115 were found dead in the cars. They were again loaded the same day and brought through to New Brighton stock yards just outside of Minneapolis, arriving August 9. Ninety-one dead sheep were removed at that time and several more were sick.

On August 10 the Live Stock Sanitary Board was notified and Drs. Ward and Kennedy visited the yards to try and ascertain the cause of death. It was impossible to tell just how many

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were sick at the time of this visit, but fifty-one died between the morning of August 9th and 11 a. m. of August 10th, at which time they were again loaded and shipped to Chicago.

As these animals had been in transit almost continuously, the attendants had had but little opportunity to observe the symptoms. Upon making a casual examination of the flock, which was composed of lambs, the healthy animals appeared to be in prime condition. Several sick ones were observed by reason of their being dull and listless. The ears were drooping and the head pendent. Labored breathing was also noticed. Several of the animals that were down were examined closely. The temperature was found to range from 106 to 108.8. The pulse was accelerated and jerky. The respiration was very much increased. They refused both food and water. The mucous membranes were deeply congested. Some of the animals had a very profuse diarrhoea, the discharge being very thin and of a very dark color, but no blood was observed. Nearly all of the sick animals showed a very marked mucopurulent or glairy nasal discharge. Most of the sick animals remained lying down, but if assisted to their feet walked without difficulty.

Several of the animals were examined post-mortem and the following lesions were found present. Ecchymoses in the subcutaneous tissue. Lungs congested. Ecchymoses on the pericardium and the costal pleura. The thoracic side of the diaphragm also showed many haemorrhagic areas. All four compartments of the stomach were more or less thickly sprinkled with ecchymoses. In some instances there were haemorrhagic areas on the intestines, but not as marked as on the stomach. The liver also in one or two cases showed haemorrhagic areas. In all instances beneath the peritoneum of the spleen there were many haemorrhages. The kidneys were found to contain petechial haemorrhages.

Specimens of the spleen and liver were brought to the laboratory in a small bottle. Owing to Dr. Beebe's absence from the city no examination was made until August 13th. Upon that date many small oval bacteria could be found in smears, made

from the tissue. A rabbit was inoculated subcutaneously with $1\frac{1}{2}$ c.c. of bouillon suspension prepared by grinding up a piece of spleen. The rabbit died the following day. *Bact. ovisepticus* was recovered in both agar and bouillon cultures from the heart's blood and liver. Many bipolar oval shaped organisms could be found in tissue smears. The original agar slope culture from the rabbit was kept until September 26th, when a tube of bouillon was inoculated from it and the following day, August 27th, a rabbit was inoculated intravenously with 2 c.c. of a bouillon culture. Rabbit died August 28th. Pure culture of *Bact. ovisepticus* were recovered in bouillon and agar from the heart's blood.

September 30, 1909, at 4.30 p. m. a spring lamb was inoculated subcutaneously in the left groin with 2 c.c. of the bouillon culture taken from the heart's blood of the rabbit. October 1st, at 9 a. m., this animal was very lame in the left hind leg, and remained lying down on its right side, breathing very shallow and died in about half an hour. In the room were several pools of very dark colored feces which had been passed during the night. A post mortem was held at 1 p. m.

POST MORTEM.—Upon removing the skin several areas of ecchymoses were noticed in the subcutaneous tissue. In the vicinity of the point of inoculation on the left groin there was an oedematous bloody area about 30 cm. in diameter and 2 cm. in thickness. The superficial inguinal lymph glands were noticed to be enlarged, haemorrhagic, and oedematous. The muscles were very pale and more friable than normal. The lungs were slightly congested, particularly the one on the right side. This congestion was in all probability due to hypostasis. The heart contained many ecchymoses varying from 1 to 5 mm. in size, located along the anterior and posterior longitudinal furrow. The thymus was very much congested and contained many ecchymoses.

The costal pleura and the pleura covering the posterior aorta contained many haemorrhages varying from 1 to 2 cm. in size.

The abdominal side of the diaphragm was also thickly sprinkled with haemorrhages.

The blood vessels of the stomach and intestines were very much congested. The mucosa of stomach and small intestines were apparently normal. The mucosa of the cæcum and colon was very much congested.

The spleen was enlarged, rather friable and thickly sprinkled with petechia.

The liver was slightly congested and contained two or three haemorrhagic areas, varying from 2 to 4 c. m. in diameter.

The kidneys were congested and contained several small haemorrhages.

October 4, 1909, at 4 p. m. a small spring lamb was thoroughly washed in the region of the groin. The sebaceous material was dissolved by thoroughly rubbing the washed area with ether. The area was then rubbed with a rough sterile towel until the blood oozed through the skin. A 24-hour bouillon culture of *Bact. ovisepticus* which had been inoculated from an agar culture recovered from sheep No. 1 was rubbed over the area with a piece of sterile cotton. The inoculated area was protected by placing a piece of sterile gauze over the surface, held in place by strips of adhesive plaster. October 5th, at 4.30 p. m., smears were made from the pus which was present on the inoculated area and many oval bipolar staining organisms were found. October 6th the infected area began to improve and October 11th at 2 p. m. a subcutaneous injection of $\frac{1}{2}$ c.c. of a bouillon culture which had been inoculated from an agar culture recovered from the heart's blood of sheep No. 1 was made in the right flank. This animal's temperature had been taken for six days previous to the subcutaneous inoculation and was found to average 103.8. At 4.30 p. m. of the day of the subcutaneous inoculation the temperature raised to 105. October 12th the animal was very lame in the right hind leg. The temperature was 106.8 in the morning and 106 in the evening.

She ate well in the morning, but at night ate very little. She drank little water all day and was dull and listless and at 6 p. m. was unable to get up, breathing very shallow while the pulse was very rapid. In the morning she was found dead.

POST MORTEM.—Performed at 10 a. m. Upon removing the skin an oedematous swelling about 2 cm. in thickness and 20 cm. in diameter was noticed on the right thigh. This swelling extended nearly around the leg.

The costal pleura was noticed to contain several haemorrhages about 5 to 10 mm. in diameter. There were a large number of petechial haemorrhages on the thymus. The heart contained several ecchymoses along the anterior and posterior longitudinal furrows. There were several ecchymoses, varying from 5 to 10 mm. in diameter, along the pleura covering the posterior aorta. The lungs showed a small amount of hypostatic congestion, otherwise they were normal. The stomach and intestines were normal in appearance. The spleen was slightly enlarged and soft.

The liver contained a haemorrhagic area about 4 cm. in diameter in the left lobe. The cortex of the right kidney was very pale and upon cut section the medullary portion was found to contain many ecchymoses. The left kidney was very much congested, both in the cortex and medullary portion and contained a cyst about 5 cm. in diameter in the posterior portion. Cultures were made on bouillon and agar gelatin from the heart's blood, liver and spleen.

Smears from the heart's blood and liver, stained with methylene blue revealed many bipolar stained organisms. After incubating the cultures at 37° C. for twenty-four hours, *Bact. ovisepticus* was found present.

October 30th a rabbit was inoculated intravenously with 1½ c.c. of a bouillon culture recovered from sheep No. 2. The rabbit died the following day and *Bact. ovisepticus* recovered in pure cultures in agar and bouillon.

November 4, at 4 p. m., a six-day-old heifer calf was inoculated subcutaneously in the left flank with 5 c.c. of a 24-hour bouillon culture that was recovered from the rabbit inoculated October 30th. The temperature of the calf for the two days previous to the inoculations averaged 101.3° F. At 7 a. m. the morning of the 5th the temperature was 102.6° F. At 4 p. m. in the

evening it was found to be 104°. It remained between 104° and 105° F. until death. She ate and drank as usual during this time.

November 6th she refused both food and water, could not get up and appeared very listless. Examination revealed a large oedematous swelling extending from the point of inoculation along the abdomen and to the posterior half of the thorax. This swelling was about 10 cm. in thickness and about 30 cm. in breadth. She died some time during the night of the 7th.

Post-mortem examination was made at 9 a. m. November 8th. When the skin was removed a bloody serous fluid oozed out from the oedematous swelling which extended along beneath the skin of the abdomen and thorax.

The left lung was very much congested. This was probably due to hypostasis, as the animal was lying on that side at the time of death. The right lung was apparently normal. Many ecchymoses were noticed along the anterior and posterior longitudinal furrows of the heart. The capillaries of the costal pleura were noticed to be very much congested. The abdominal organs were found to be apparently normal. Cultures taken in agar gelatin and bouillon from the heart's blood and liver revealed *Bact. ovisepticus* after twenty-four hours' incubation. Smears from the same sources as cultures showed a small number of oval bipolar stained organisms.

This strain of *Bact. ovisepticus* had a tendency to show bipolar staining in tissue smears. This property, however, was not as pronounced as with some of the other organisms of this group. The tendency to form chains in liquid media might easily lead one to mistake it for a streptococcus or diplococcus. In cover glass smears they were from .5 to .8 micron broad and 1 to 1.5 micron in length and the ends rounded. The central portion was usually faintly stained while the ends were a very intense color when stained with either Löffler's methylene blue or carbo fuchsin. They did not retain Gram's stain. In bouillon cultures there was a tendency for them to stain uniformly throughout, although usually several organisms could be found in a field that showed the bipolar staining. The organism was non-motile aero-

bic, grew best at 37° C., but would grow slowly at room temperature. In plain bouillon and dextrose bouillon a heavy growth was produced with a very thin pellicle which was easily broken upon shaking. Dextrose broth becomes acid in reaction. No indol was produced in Dunham's solution. Milk was not coagulated and no perceptible growth took place on potato. A very scant growth was noticed on the surface and along the line of inoculation in a gelatin slab culture.

It is unfortunate that conditions prevented the collection of more tissue, and that it was impossible not to make a more thorough investigation of this outbreak.

Upon examining the evidence it will be seen that the same symptoms, lesions and short duration of the disease were similar in the naturally infected animals and the experimentally infected ones. The organism isolated from the spleen of the sheep was very virulent for sheep and less so for calves, as was shown by the longer duration of the disease and the marked local oedematous conditions extending from the point of inoculation and the scarcity of the organisms in the blood smears after death. Although it was impossible to make an entirely satisfactory examination on account of scarcity of material it would seem from the above evidence that the *Bact. ovisepticus* isolated was the cause of the disease.

CAB HORSES IN PARIS.—Paris—and the rest of the world—had its laugh when a few women undertook to earn their living by cab driving. But the women have succeeded; they make the living they are after, and incidentally better the lot of the Paris cab horse—never a very happy one—as far as they can. It is said in one of the cab stables that a certain horse, regarded as so vicious that no man driver would use him, has by a woman's kind and gentle treatment been so tamed that it is one of the best animals in the stable.—*Youths' Companion*.

THE APPLICATION OF MEDICINAL AGENTS TO DISEASE.*

BY F. F. BROWN, D.V.S., KANSAS CITY, MO.

The use of drugs in relation to disease is as old as the human race itself. With suffering comes an immediate search for relief, and it was but natural, before the true value of drugs was understood, that the sufferer should turn to some agent that would impart an unusual sensation or experience in the hope that the affliction might be abated. Early experience demonstrated that certain drugs would produce certain definite results, and upon this small nucleus of empiricism our present knowledge of medicine is largely built.

Empiricism is not to be criticised too harshly for it has added much to successful therapy. Its practice will likely continue with reference to those diseases that thus far have baffled the skill of the most eminent pathologists. Therapeutics is still an inexact science, for pathology must blaze the way to its rational application. As rapidly as the cause and nature of disease is demonstrated, just that promptly will the field be opened for the intelligent application of remedial agents.

The uncertain footing of therapeutics in the past, due largely to lack of correct pathologic understanding, gave rise to differences of opinion among men, and through scepticism, the opportunity was given for a new school of medicine to come into existence. Furthermore, there has been promoted a numerous class of so-called sciences, that ignore the use and decry the value of medicine, and under the cloak of mysticism practice their art upon

* Presented at the Forty-seventh Annual Convention of the A. V. M. A., San Francisco, Sept., 1910.

whosoever applies. The promoters of these latter find in the human family a mental attitude and credulity not expected in the lower animals, and hence veterinary therapeutics has a right to attain a higher degree of exactness than can ever be hoped for in human medicine.

The fact that there has been uncertainty in the application of drugs in the past, should not deter us from readjusting ourselves in the light of present pathologic knowledge, and seek to place drug therapy upon a more commanding plane.

Scores are rushing into the fields of specialization. The surgeon, the pathologist, the bacteriologist and the sanitarian are all attaining eminence, but where is the really great veterinary therapist of to-day? Is the field not sufficiently inviting, or fascinating, or is the relief and cure of afflicted lower animals not a noble calling? Perhaps the task is too great; for he who would select with wisdom the proper drug that shall meet a given disorder, has a mighty task at hand. Such a man must be well versed in anatomy, histology, physiology, chemistry, and all that goes with pathology and diagnosis. He must be conversant with all the properties of the thousands of available agents, and must know from the nature of the disease just what effect is needed, and select and administer in dosage sufficient to produce that effect, and be able to recognize the action when produced. Such a person may be likened to the young man who once desired to qualify himself for the legal profession, and upon seeking the advice of an eminent jurist asked, "What must a man know in order to practice law successfully"? The man of learning replied "Everything." The man that hopes to master and understand just how a little particle of matter we call medicine influences tissues and organs when diseased, must be content to spend a lifetime in keen observation and clinical study.

Much as we desire to know, there are perplexing problems yet unsolved. Even the chemist has not made it clear why some agents are toxic and some harmless, why one agent has an affinity for one tissue and another another, why some drug will

exalt the function of a gland as it passes through it in the process of elimination, and another not disturb it in the least.

The reaction that certain tissues give to certain drugs is something marvelous, and is frequently of such intensity as to cause prompt cessation of life.

In a general way, the majority of medicinal agents must reach the blood stream before they can exert any marked systemic or local effect. In order to reach the blood they must first be in solution, or if administered by the mouth, must be capable of undergoing solution in either water, acid or alkaline media.

If drugs are to be absorbed by way of the alimentary tract, the condition of that canal should be determined in advance, for if its function is suspended through derangement, the results will be highly disappointing. Only so much of a drug can exert its action in such a case as is circulating in the blood, and frequently the process of elimination keeps pace with tardy absorption, giving no opportunity for physiological effect.

It is beyond our understanding to foresee the chemical change that may occur in drugs during their passage through the body. Even before absorption takes place they are subjected to the action of both acids and alkalies which results frequently in altered forms.

In passing through that gland of complex functional activity—the liver, there are undoubtedly chemical alterations, and even positive destruction, but experimental research has never been able to tell to just what extent. The liver is apparently the chief factor in modifying absorbed toxic agents, so that when a substance is released again in the blood stream, it is no longer capable of exerting a pernicious effect upon the economy. The remarkable tolerance to poisonous agents that can be developed in a body, by giving graduating doses, is probably due to the energies of the liver in this direction.

Again, when an agent reaches the circulating fluid there is still opportunity for chemical change. Should the drug at this time be of a nature such as is required for reconstructive pur-

poses, so much as is needed will be appropriated, and the excess or remainder will be carried by the current to special points for elimination.

Many agents have for their only mission the bringing of constructive material to the tissues, so that a normal balance may be preserved.

Others of the so-called alterative class counteract morbid processes, or influence metabolism in some unknown manner, and are afterwards eliminated from the body. When the true pathology of a long list of diseases becomes known, we shall doubtless reach a better insight into the methods by which this class of drugs modify and cure disease.

Many drugs have the property of stimulating to greater activity the glands through which they pass out of the system, and are of great value in preserving the normal status, or even augmenting the activity of a part during disease.

It is frequently impossible to combat the etiological factor of a disease directly, and one must be content to permit the ailment to run its course. In the meantime, if the avenues of elimination are stimulated to expel from the system the developing toxins and morbid products of disease, the tissues of the body do not become greatly weakened, and reaction and resolution take place rapidly.

Some drugs possess a variety of actions, all of which are not desirable. These peculiarities must be taken strictly into account in general practice; by way of example, it might be stated that castor oil serves as an efficient purge in the dog, but the use of this drug is highly disappointing in that animal if already effected with nausea. Formalin is a very efficient antiferment, but when administered to the horse in gastric flatulence, too often establishes an oesophagitis by being eructed with the accumulated gases, thus making it an unsafe agent.

No agent will relieve the pain and relax the entire muscular system in that dreaded disease haemoglobinuria like chloral hydrate, but just when recovery seems assured an intractable

nephritis develops, due to the irritating chloralic acid undergoing elimination through the kidneys.

The writer observed a horse not long since suffering from a severe attack of encephalitis. It was impracticable to administer the desired agents in the usual way, so it was decided to give a subcutaneous injection of a preparation containing morphine, hyocine and cactine. The first injection had no apparent effect and it was repeated in due time. In about thirty minutes subsequent to the last injection, the animal was taken with the wildest delirium, and expired shortly afterwards. The practitioner had not reckoned with the delirifacient properties of two of the agents in the preparation, which doubtless would not have asserted themselves in a normal animal.

The field of human medicine is being flooded with proprietary medicines of every description, and even the veterinary branch is being exploited in quite a measure. Many of these private preparations are useful in their place, but they have a baneful effect upon the practitioner who adopts them. Just in proportion to the extent he uses them, just to that extent his knowledge of the true application of drugs for the relief of diseases ceases to grow. He no longer has an incentive to study and to develop, but shrivels and shrinks, and permits some one else to do his thinking for him.

Closely allied to this is the tendency of some practitioners to follow a beaten path, by prescribing some fixed formula that he may have tucked away in his memory, or a convenient note book, for a patient without due regard for present conditions or stage of the disease. Such practices are ruinous to the progress of any man, and should be studiously avoided at the very beginning of practice. It is a sign of early retrogression and if allowed in one's self, will terminate in unpardonable empiricism.

Every member of the veterinary profession should feel it his duty to add something to our fund of therapeutic knowledge; to study medicinal agents with a view of determining their actions on animals, and at all times to attempt to prescribe the particular remedy needed at that particular time of the examination. By

following this method a greater proficiency will not only be attained in diagnosis, but in the healing art as well, and as one becomes accustomed to the progress and peculiarities of disease, and its behavior under medicaments at his hand, he becomes impressed with the fact that he is the possessor of a knowledge and a power, that he is able to wield with certainty, for the betterment and relief of the animal kind.

RESOLUTION ON BOVINE TUBERCULOSIS.—Passed at the recent meeting of the Washington State Dairymen's Association.

We, the committee on legislation, to whom were referred all propositions concerning legislation with reference to bovine tuberculosis, beg leave to report as follows:

We favor the amendment of the present law in order to make it include the following points—

First, the compulsory testing of all dairy cattle and the requirement of certification of tuberculin test for all dairy animals sold, except for purposes of immediate slaughter.

Second, the adoption of an official system of marking reacting animals in such a way that they can be definitely identified.

Third, to provide a method of slaughter of reacting animals under state or federal supervision and remuneration for animals so slaughtered to the amount of twenty-five (25) dollars for each grade and fifty (50) dollars for each pure-bred animal, with exceptions in case of animals valuable for breeding purposes to be kept in quarantine.

Fourth, the prohibition of the sale or feeding of unsterilized milk from reacting animals.

We further recommend that the State Agricultural College be requested to offer in its farmers' institute and extension work instruction to dairymen in the use of and value of the tuberculin test.—E. E. FLOOD, W. J. LUNN, D. S. TROY, F. E. SMITH, BEN E. HARRISON.—*Horn and Hoof.*

TOXIC PLANTS AND THE POISONING OF ANIMALS.

By D. ARTHUR HUGHES, LITT.M., PH.D., D.V.M., CHICAGO VETERINARY COLLEGE, CHICAGO, ILLS.

"Observation and memory are faculties commonly existing together in the same mind: so that he who has extraordinary powers of observation usually has an equally extraordinary memory by means of which he readily recalls the miscellaneous points he has observed."—Lord Kames's "Elements of Criticism."

Something over a year ago I called attention, in this journal, to the prospective appearance of an important work on poisonous plants destructive to domesticated animals, by L. H. Pammel, Ph.D., Professor of Botany, Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa. That work, or rather the first part of the work, has, within a few weeks, come from the press.* My object in writing this note is to call the attention of the profession again to this important work.

Dean Stange's article, in the January, 1911, number of the AMERICAN VETERINARY REVIEW, on Silage Poisoning, valuable as it is, is an instance of articles on poisonous plants which sporadically are printed in our veterinary journals, all of which indicate how very much of a menace toxic plants of various kinds are, and that the sum total of deaths caused by them is very large. This indeed is true as is shown in statistics which have been brought forward by men like Wilcox, Chestnut, Knowles, Glover, Nelson and many others. The wonder is that more information has not been given to veterinary students in our colleges on toxic plants harmful to stock, than has been

* The Torch Press, Cedar Rapids, Ia. The book sells for \$2.50, with postage additional.

done in many since medical botany was made a required subject, for the curricula of recognized colleges, by the combined action of the United States Department of Agriculture and the United States Civil Service Commission. The fact is that Medical Botany should be given even a larger place in the curriculum than is accorded it now. Dr. Pammel's book is a sign of the times. Its appearance is indicative of a need well known to us all; but seldom admitted by many. Poisoning by careless administration of drugs is rather uncommon; at least it only occasionally occurs. It is affected by the ignorant use of drugs by quacks; or else by the bungling of others. But the poisoning of animals by ingestion of poisonous plants, or by the ingestion of herbage rendered toxic by growth of fungi upon it, as in Dean Stange's case, is undoubtedly a very common occurrence. We should have more knowledge of these conditions. Hence the advisability of the publication of such a work as this of Pammel's. When I was at Cornell University as a veterinary student there was no separate course offered us on poisonous plants destructive of live stock—such a course as that given by Professor Pammel to the veterinary students of Iowa State College. It seems to me that such a course should at least be offered in all our colleges, and it would be better if such a course were required.

The part of Pammel's work which has already appeared, the first part, consists of 150 pages octavo, entitled, "A Manual of Poisonous Plants Chiefly of Eastern North America, with Brief Notes on Economic and Medicinal Plants and Numerous Illustrations." Chapter 1 treats of poisons and statistics of poisons. Chapter 2 speaks of bacterial poisons. Chapter 3 is on dermatitis. Chapter 4 deals with forage poisoning, ergotism and aspergillosis. Chapter 5 has fungi as its subject, while chapter 6 has to do with equisitosis, locoism and lupinosis. In the few following chapters we find the author dealing with delphinosis, lathyrism, aconitism, veratristism, hydrocyanic poisoning, poisoning from opium, saponins, flowers, honey, and with mechanical injuries of plant origin. In chapter 11 Dr. Pammel

has a classification of poisons, symptoms and antidotes. Chapter 12 is upon the production of poisons in plants. In chapter 13 there is much information on the relation of algae in water to animal disease—a subject of which few veterinarians know much to-day. In chapter 14 is a catalogue of the most important poisonous plants in the United States and Canada. In chapter 15 this part of the work closes with much information on alkaloids, glucosides, gluco-alkaloids, saponins and allied matter.

When finished, Dr. Pammel's work will consist of about 600 pages. Just now we have in the first volume only 150 pages, so that we are left guessing what is yet in store for us. But the indications are that, when completed, we will have something worth the having. There are numerous illustrations scattered throughout the first volume, placed there in order to impress the reader with the appearance of whole plants or portions of plants mentioned in the text. These are helpful in their way. But one cannot help but wish that the author had also incorporated a number of lithographs of the most important of the poisonous plants. The difficulty is that this would increase the cost of a work, which, with the exercise of the most rigid economy, must have been a very costly undertaking.

Bacon, centuries ago, said, in one of his classic essays, reading makes a full man; conversation a ready man; writing an exact man. It is equally true in veterinary practice that careful observation makes an accurate man. Fortunately, as Lord Kames in his "Elements of Criticism" has justly remarked, observation and memory are faculties commonly existing together in the same mind; so that he who has extraordinary powers of observation usually has an equally extraordinary memory by means of which he readily recalls the miscellaneous points he has observed. These are faculties which must be brought into requisition in veterinary practice to save us from numerous errors in diagnosis. Stock owners are so apt to throw up their hands in alarm when a few animals in a flock or herd die from what is believed to be an infection. We are coming to see many such deaths are caused rather by faulty feed than by a

fault in permitting an infection to take place. The ingestion of poisonous plants is being found to be the cause of many losses over widespread areas. Instead of shuddering with alarm at the untoward dispensations of Providence which come as a murrain or plague upon cattle, we are seeing that the debenture must be placed to our own carelessness in allowing the animals to forage on poisonous plants, to eat silage or grains affected with cryptogams, or to drink water alive with algea or fungi, not to say anything about bacteria. Close observations of these things is the preventive of the mistakes in diagnosis of which I have spoken. The remembrance of them distinguishes the veterinarian who has learned the chief facts on poisonous plants destructive to live stock from him who still gropes in outer darkness without this special knowledge to set him to rights. If Dr. Pammel's manual does nothing more than introduce, in book form the subject of poisonous plants to the profession to which we belong, it will have rendered us a service. Certainly a pioneer bookmaker in this field deserves our support. His work can profitably be bought by practitioners, especially those in country practice, everywhere, who are the ones most likely to be puzzled by deaths from causes of which this book treats. I cordially recommend Dr. Pammel's manual to veterinarians of North America; though the completed work, two volumes totalling 600 pages, should be useful for reference and commentary.

THE OHIO HORSE BREEDERS' ASSOCIATION will hold its annual meeting February 9 at 2 p. m. in a room adjoining the corn show on the state fair grounds, Columbus, Ohio. The program will include discussions of the capsule method of breeding and contracts with owners of mares by Ohio breeders. "Breeding Percherons in Ohio" will be discussed by Wayne Dinsmore, secretary of the Percheron Society of America. "The Operation of the Pennsylvania Stallion Law" will be the subject of an address by Dr. C. W. Gay, of Pennsylvania.—*Breeders' Gazette*.

RABIES.

BY DR. JACQUES E. AGHION, VETERINARIAN STATE DOMINION, SAKHA, EGYPT.

Rabies is a specific infectious disease affecting warm-blooded animals and more so the dog tribes. It was known and recognized to be a distinct communicable disease many centuries prior to the beginning of the Christian era. The disease is transmitted from animal to animal or from animal to man only through the bite inflicted by a rabid animal, and artificially by inoculating the virus. Experiences show that the blood of rabid animals is free from the virus, but milk and saliva are highly infectious; the virus seems to travel through the nerves to the central nervous system and never through the blood stream, hence the deeper the bite or wound, and the nearer to the head, the greater the danger of a fatal result and the shorter the period of incubation.

Many people, especially Arabs, seem to believe in the applying of a red hot iron to the wound inflicted by the bite of a rabid animal, with the condition that the wound must be kept from water for a period of not less than forty days, and the part above the wound must be vigorously tied up so as to prevent the blood from circulating to the upper part of the body. Bleeding and cauterizing were also practised. But now, thanks to Pasteur's investigations, we become to know better and apply his only reliable method of treatment. Five cases of rabies in dogs were brought to the notice of the writer, and only one case in horses, which I will endeavor to describe.

On June 13, 1910, I was called out to see a gray Arab mare six years old, presenting the following symptoms: Great distress, profuse sweating, difficult breathing, eyes fixed at some

imaginary object, the pupils dilated, mouth partly open with a hanging tongue, difficulty in swallowing, spasm of the throat, head and neck stiff and bent to one side, animal is violently excited, pawing and biting every object in sight. Strange to say that she never attempted to bite her six-months-old colt, which was allowed to go loose about her. She died the second day after exhibiting the above symptoms.

HISTORY OF THE CASE.—The mare has been bitten on the upper lip forty days before any symptoms of rabies were visible. She was bitten by a dog which was shot on the spot on being suspected of rabies.

POST-MORTEM EXAMINATION.—The following findings were present: The stomach congested and contained some foreign bodies such as bits of wood, straw, etc.; liver, spleen, oesophagus and pharynx were badly congested; the tonsils and epiglottis injected; heart practically normal; the mucous membrane of the brain and the spinal cord congested.

THE following was clipped from the *Breeders' Gazette* of January 25, and we regret exceedingly that we cannot present the picture that accompanied it, showing a six-in-hand dog team attached to a fair-sized sleigh:

"An interesting illustration affords a glimpse of conditions in the Soo or Lake Superior country which are ordinarily supposed to obtain in Alaska or the North Pole regions. The picture shows a veterinary surgeon about to start out on his rounds among the great lumbering camps where much work usually awaits his coming. His faithful team of dogs performs wonders, almost miracles, in traversing the woods, often in unbeatened paths from camp to camp.

"Before the coming of the railroads such teams (though greatly inferior in appearance) constituted the motor power of the mail and stage route between Saginaw and the Soo—300 miles—and between the Soo and Marquette, 150 miles. Dog teams are still much used by residents of the Upper Peninsula of Michigan."

REPORTS OF CASES.

TREATMENT OF IMPACTIONS FROM STRAW, HAY AND ALFALFA.

BY WILLIS WILSON, D.V.S., Dayton, Washington.

Among the various articles of extreme interest to the veterinarian contained in the November number of the REVIEW, I have selected the one written on "Impaction from Alfalfa Hay," by Dr. McGinnis as being one that comes closely to meeting with conditions as met by the veterinary practitioner in his daily routine of business.

It seems to be the unwritten law, and a good one too, that the young practitioner should stand aside and leave to his older brother in the profession the duty of delving out the advice and technique to be followed in all things that tend toward the alleviation and cure of the malformations and diseases of our animal friends. Nevertheless I can see no harm in handing out a few suggestions that to me seem to be helpful.

The young man just starting out to build a practice in a community where there is considerable competition (I say competition, for such is often the case regardless of what it should be, is eager and waiting for something new, something that he has never yet tried, that he may be able to increase his efficiency. This constant thirst for new methods is bound at times to cause him to accept things for law that in reality are only theories.

The experience gained by these hasty conclusions are sometimes costly and cause him to study out a few methods for himself which, if they prove successful, I believe should be given out without waiting for riper years of experience, that all may accept or reject at their pleasure.

This matter of impaction from straw, hay, alfalfa, and dry feeds in general, has constituted a very large percentage of the

ills that have come to my attention since practicing, a little less than eighteen months, and I have tried several lines of treatment, but none with such satisfaction as with the old time rectal massage, accompanied with the administration of slowly acting purgatives.

In my opinion a horse suffering from intestinal trouble and presenting a negative or at least doubtful history of his previous care and feed, should seldom if ever receive a dose of medicine before he has first been submitted to a rectal examination.

The indications for the use of our quickly acting purgatives, notably arecoline, eserine, and barium chloride, will, I believe, be very materially reduced if we will only wait a few minutes until a rectal exploration can be made and the exact condition of the bowels be determined.

It would be at best useless and dangerous if not actually criminal to administer a hypodermic purgative to an animal suffering from an impassible intestinal obstruction before the offending mass is broken down or at least softened to such an extent that the increased peristaltic action can be dissipated to an advantageous end. Hyperdermic purgatives undoubtedly fill an important office in veterinary medicine and no progressive veterinarian should be ignorant of their indications and uses, but I believe a great many valuable horses are victims of a too hasty conclusion upon the part of some practitioners regarding their administration.

The technique which I have adopted in this respect is very simple and in my hands has been productive of highly encouraging results.

Take, for instance, an animal that has been kept on dry feed, such as straw, hay, and in my locality, alfalfa hay. He may come with the history of the evacuations being unusually loose and watery, and may in fact show evidence of diarrhoea at the time of making the examination. On this account the owner is generally of the opinion that his animal is affected with some grave ailment of his "water works" and has administered the remedy that never before failed of a cure—nitre. The animal by this time is found to be in considerable pain and is exhibiting the usual severe symptoms. The average case of impaction when the veterinarian is called usually requires something to be done quickly. Here indeed seems to be the place for a hypodermic purgative with the result probably, if given, a dead horse and a lost client who yet thinks his horse's kidneys were at fault.

A much better plan I believe is as follows: After having provided a bucket of warm water, a bar of soap, and a towel, thoroughly soap both arms to the shoulder. Pare the nails closely on both hands and after inserting the arm into the rectum, palpate the intestines thoroughly especially the small colon. If the impaction is found to be either in the small colon or the pelvic flexure of the large colon, it offers a more favorable aspect for what is to follow.

After locating the obstructing mass, either push it to one side against the abdominal wall or grasp it between the thumb one side and the ends of the fingers on the opposite and by gentle and constant pressure it will be found to yield. Continuing this procedure a channel may be made along the entire side of the mass which will permit of the passage of flatus, and at the same time will allow the softer and watery faeces usually anterior to the point of obstruction (due to the presence of enteritis before you were called) to pass along the entire side of the impacted mass and soften it up.

I have had several seemingly hopeless cases to yield to this treatment and go right along to an uninterrupted recovery with nothing more than an ounce dose of fluid extract of aloes in a quart of raw linseed oil.

Sometimes the mass is found to be too resistant to be broken down by this method, and in a few instances I have found it possible to grasp the gut anterior to the mass and by gently squeezing against it as though forcing a ball through a rubber tube by pressure on the outside of the tube, to cause it to move along far enough to become enveloped by a portion of the intestine that has not become paralyzed by pressure and thus to pass along.

One of the disagreeable features of the rectal massage is that it requires the removal of more clothes than is conducive to comfort; especially in an open stable or in the corral. This I have partly overcome, or I should have said, my wife overcame, by removing the sleeves of my undershirts and providing a series of glove fasteners on the shoulders of the shirts and also on the loose sleeves in such a way that they may be worn when needed, and at the same time making it possible to completely bare the arms without the removal of more than the outer shirt. This idea we gladly give to the suffering profession without thought of royalties or patent rights.

INFECTIOUS ANEMIA.

By D. J. HALLORAN, M.D.C., Oconto, Wis.

About August 15, 1910, I was requested by a local lumber company to go up into Michigan a distance of 150 miles to see a herd of horses consisting of sixty-five head, that were at pasture.

Upon arriving four horses were in the barn sick, and they reported three having previously died. I found the following symptoms: Temperature ranging from 104 to 106 degrees; pulse ranging from fifty-eight to seventy-two, quite strong, but very irregular; in some a regular pulse and a typical "pink eye" and a very pronounced staggering gait when moved, and a marked relaxation of the sphincter muscle. The floor of the barn was such that had polyuria been present it would not be noticeable. All retained a fairly good appetite.

I examined the pasture and found conditions favorable except the water. The horses had been drinking from a small stream that had become rather low. A well was dug at once and an abundant supply of apparently good water was obtained. Access to the creek was fenced off.

My diagnosis was "Acute Influenza." I put the sick horses on treatment indicated for influenza, consisting largely of doses of quinine, nux-vom. and echinacea.

I saw the horses ten days later; some of those that were sick on my first visit had returned to pasture, others were taken in sick and one died. On the whole the results were not very satisfactory. I, having a few doses of influenza anti-toxine with me, injected into the blood stream one ounce at a dose and prescribed other treatment.

After that another doctor was called into the case and pronounced the disease "Infectious Anemia," and treated them after that. On account of the distance I did not have advantage of a consultation, and saw no more of the horses until October 22.

A carload consisting of eighteen head was shipped to Oconto for the purpose of putting them to work. They were supposed to be horses that had not developed the disease. After two days in transit I was called again and found six horses presenting the same symptoms that I found on my former visit. I realized then that I had something different than influenza. After reading what literature I could find on "Infectious Anemia" I

concluded it took on a chronic form and the subject would live from three months to a year and many of those horses died within a week after the first symptoms were observed. I was slow to accept the diagnosis of the doctor who called it "Infectious Anemia."

The report at the office were to the effect that they had lost ten head and four more were in such a condition that they expected they would die. They also reported that the horses receiving anti-toxine appeared to do better than those not receiving any.

The disease having run so long and the company sustaining a heavy loss that when the treatment of those eighteen fell again into my hands I was anxious to find out the exact cause of the trouble.

I arranged for a blood count to be made through the kindness of a local physician. I had a count made only after a few days delay on the strength of the favorable report of the anti-toxine.

While waiting I procured a supply from P. D. Co. and gave one ounce direct into the blood stream where the temperature was over 104 degrees and repeated every twelve to twenty-four hours until the temperature returned to 102 degrees. One horse required three doses and this was the only horse that did not suffer a relapse.

Finally, having a blood count made on the horse whose condition indicated that the disease was in a more advanced stage than the others, the count showed 3,712,000 red corpuscles per mm. This confirming the diagnosis of the other doctor.

About this time I called Dr. Clark, of Marinette, who has had considerable experience with infectious anemia, in consultation, and he pronounced them typical cases of infectious anemia and offered valuable suggestions in regard to treatment.

I put the eighteen horses on sulphocorbolates, three tablets in feed t.i.d. and Fowler's Sol. and Tr. Ferri Chlor, in large doses in drinking water, three times a day, and I advised gentle exercise; which, in spite of my protest was soon changed to light work. The horses appeared to be doing very nicely until November 20, when I found three having a temperature of 106 degrees to 106.4 degrees, and a very irregular pulse which was hard to describe.

In leading a horse the length of the barn the pulse would increase one-third, running up to about ninety per minute. I

learned next day that those three horses had been used the day previous in drawing heavy timbers out of the river.

I put them on stimulant treatment and in a week they were playing in the yard and since then have had no more trouble.

At present they are all at light work. I admit this looks like experimental treatment, but the apparent results are so far satisfactory.

There were four horses that received two doses each, and one three doses, and the others only one dose.

The only explanation I can offer is that the influenza anti-toxine produced a leucocytosis and in that way prevented recurrence.

I hope to hear from some brother veterinarian who has had some experience with "Infectious Anemia."

As literature on the subject this paper is very meager.

At this date, January 7, 1911, all the horses have been sent to the woods to be put to work.

PEROXIDE IN PNEUMONIA.

By Veterinarian WM. P. HILL, 1st Field Artillery, Ft. Wm. McKinley, P. I.

I notice a report in the October REVIEW on the use of "Peroxide in Pneumonia." I have tried this in one case and had thought up to the time of reading this report that the treatment was original on my part, and intended waiting until I had further chances to test the efficiency of this treatment before reporting results, but as the ice has been broken, I herewith append the particulars of my case, hoping it will be taken up and tried by the practitioner in general practice. This was a trooper horse of the 12th cavalry that had had pneumonia for two weeks, and everything had been done to relieve him but with little success. The left lung was consolidated and the right was gradually filling in. Nuclein, tallianine, stimulants and expectorants with hot packs had all been tried and the case pointed to a fatal termination. I then decided to try H_2O_2 intravenously. I put four ounces in a pint and a half of normal salt solution and injected it slowly, using an ordinary Omega rubber syringe with the needle attached by pushing it well into the tube to prevent leaking. I noticed no especial distress from the injection. The temperature was 105 degrees Fahrenheit; in four

hours it dropped to 103 degrees Fahrenheit, and the horse seemed to be brighter. I repeated the dose, when the temperature dropped to 101 degrees Fahrenheit at the end of the fifteenth hour from the first injection. I left the horse for the night and when I saw him the next morning I was agreeably surprised to find him switching flies and eating, neither of which he had done for the last two days. The temperature was up to 103 degrees Fahrenheit. I repeated the intravenous injection and gave him another that evening, leaving him with a temperature of 101 degrees Fahrenheit at night. The next morning he was markedly better, the right lung was clearing up and I thought I heard some resolution in the left; he was much better in spirits, eating grass heartily and everything began to look hopeful. His temperature kept at 101 degrees Fahrenheit. This morning he started a "pea soup" diarrhoea which was weakening him. I gave astringents and stimulants, but with no abatement of the discharge. The next morning he was dead in his box-stall, the attendant informing me he died at 5 a. m. I feel confident that he was well on to the road to recovery when this purgation set in. From the results obtained in this one case I cannot help thinking if I had started this treatment a week sooner I would have a live horse to-day. I hope all who read this will give it a trial and report results. Use a big needle and a long one and push it well into the vein and hold it steady while injecting.

A MONSTROSITY.*

By W. A. McEWAN, M.D.C., Hampshire, Ill.

I was called to see a thoroughbred Holstein cow, having difficult parturition. Labor pains commenced at (6) six a. m., so the owner thought he would assist in the operation; but with fruitless results. After getting head and forefeet through vulva with aid of block and tackle, gave it up for a hopeless case. He did not call me until 12.30 p. m. On arrival I found my patient very much exhausted. I immediately prepared myself and made an examination of the foetus. Finding that the abdominal cav-

* The Doctor kindly sent a photo of above described monster, but it was not sufficiently clear to make a cut from.

ity was grown wrong side out, bowels hanging to foetus, with croup resting on shoulders, and the hind feet coming the same as the front ones, with exception of the left hind foot caught under the pubis; after relieving this difficulty the foetus was delivered with ease, and from all appearances proved to be a full time calf. With aromatic spts., nux and other ordinary treatment, the cow made a complete recovery.

A TYPICAL BLOOD PICTURE OF PERNICIOUS ANEMIA.

By B. F. KAUPP, Fort Collins, Colo.

The photograph shows a typical blood picture of Pernicious Anemia. There was no misleading gait of hind quarters, no profuse stalng, no relaxation of the anal muscles or petechia of



the visible mucous membranes. The animal has been rapidly going down in flesh for two months; pale visible mucous membranes, anemic heart rhythm; edema of sheath and hind legs. Blood showed time of coagulation, eight minutes; hemoglobin, 40 per cent.; erythrocytes, 1,865,000; leucocytes, 13,000; polymorphonuclear leucocytes, 30 per cent.; lymphocytes, 69 per cent.; mononuclears, 1 per cent.; eosinophiles, 3 per cent; iodo-phylia, 2 per cent.

AN INTERESTING CASE.

By C. L. WILHITE D.V.S., Manilla, Iowa.

Bay, two-year-old mare, coach, about 900 pounds. Long-limbed, tall; limbs good shaped and clean. Has been ailing six weeks to my knowledge; have seen the colt four times in that time and there was no noticeable change at any visit. Temperature, 101 degrees Fahrenheit; respiration, 26; pulse, 52; slightly stiff in gait when walking; drags toes of front feet when trotted; appetite good. The *pronounced* symptom is that she crosses the front feet when drinking from a vessel as low as the knees and will go without water rather than drink lower. The pectoralis anticus muscles are contracted and hard. Hair is sleek and eyes bright. There is no soreness on palpation anywhere that I can discover. Treatment: Blister on pectoralis muscles. No results.

DYING IN HARNESS.

Only a fallen horse, stretched out there on the road—
Stretched in the broken shafts, and crushed by the heavy load.
Only a fallen horse, and a circle of wondering eyes
Watching the cruel teamster goading the beast to rise.
Hold! for his toil is over—no more labor for him;
See the poor neck outstretched and the patient eyes grow dim.
See, on the friendly stones how peacefully rests his head,
Thinking, if dumb beasts think, how good it is to be dead.
After the burdened journey, how restful it is to lie
With the broken shafts, and the cruel load—waiting only to die;
Watchers, he died in harness—died in the shafts and straps;
Fell, and the great load killed him; one of the day's mishaps:
One of the passing wonders marking the city road—
A toiler dying in harness, heedless of call or goad.

John Boyle O'Reilly in Our Dumb Animals.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

DERMOID CYST OF THE SOFT PALATE WITH CLEFT PALATE [*R. M. Aulten*].—When a foal, this little fellow had exhibited stertorous breathing and occasional return of food by the nose with excessive salivation. A growth was then detected within the fauces, but on account of the small size of the animal's oral cavity, was left alone. The foal could feed well and was otherwise in apparent perfect health. It was only when he had reached about one year that the attention of the author was called to him. Examining the mouth, a growth was detected, hanging on the end of the soft palate, which was besides, cleft. The tumor had been injured by the molars and bleeding at the mouth was the result. The growth was rather movable and at times could not be seen as it had moved back in the pharynx. The animal was cast, the mouth kept open with speculum and the tumor removed with the ecraseur. The cleft palate was left alone. The animal did well and was not apparently disturbed by the split of the palate.—(*Veter. News.*)

INVAGINATION OF THE CAECUM [*Wm. J. Watt*].—This ten-year-old horse has worked for four hours and coming home has shown a little abdominal pain. Nothing abnormal is detected in him. Ordinary treatment is prescribed, but without giving much relief. The next day as he has passed no feces, he receives a hypodermic injection of eserine and pilocarpine, which acts in ten minutes. The horse was relieved of an enormous quantity of liquid matter and was nearly free from pain. For a few days he took some green food and drank a small quantity of water. Then he refuses everything, his pulse runs up to 64, his temperature to 102.5° , and his respirations to 30 in a minute. He dragged on in that condition for about a week and died. Rectal examination made the day before his death, gave the impres-

sion of a considerable quantity of feces accumulated in the colon. On opening the abdomen, in making the autopsy, a large quantity of foetid brown stained exudate was found. The cæcum could not be detected until the colon was cut into. It was found full of gelatinous straw-colored material.—(*Veter. Record.*)

CAUSATION OF RICKETS [*Fred. W. Cousens, M.R.C.V.S.*].—After an examination of the etiological theories, the effects of deprivation of exercise and with the results of experiments carried out by the author, in a well illustrated article the following conclusions are presented:

1. Not one of the many theories which have been elaborated to explain the cause of rickets has been universally accepted, and they all lack, not only from the clinical, but also from the experimental aspect, unequivocal proof.

2. It is some error in feeding, which in this country and America is commonly believed to bring about the disease, but it is doubtful; however, if feeding plays any important part in the etiology of rickets, experimentally, the author, like several other observers, have been unable to cause the condition by improper feeding.

3. By confining young dogs and depriving them of exercise, rickets has been invariably induced by our experiments, and that although their diet was beyond suspicion, the air which they breathed pure and their kennels were kept scrupulously clean, whereas control animals allowed exercise, but otherwise similarly treated, did not become affected.

4. Examination of the condition under which rachitic children are reared reveals one constant and invariable factor in their lives, namely, confinement. Alike, then, on clinical and experimental grounds, it is accordingly concluded that confinement with consequent lack of exercise is the main factor in causing the disease—(*Veter. Journ.*)

TUBERCULOSIS IN A SCOTCH TERRIER [*J. F. Craig, M.A., M.R.C.V.S.*].—Interesting case on account of hepatic lesions and symptoms resembling those of ascitis. The dog's abdomen beginning to increase in size was the first manifestation. It is very largely developed and is almost coming in contact with the ground. The mucous membranes are pale and the temperature 101.8° . Appetite and bowels are normal. Heart sounds slightly muffled. Respiration much increased if animal is raised by his hind legs. Palpation does not indicate ascitis. On manipula-

tion a swelling is detected in the anterior part of the abdominal floor. Laparotomy is performed. A large dark swelling, well defined and as large as a man's head presents itself. This is a large abscess, which on being opened leaves its contents escape through the abdominal wound. Attached to the diaphragm, it was developed in connection with the liver, which was found to be the seat of large tuberculous deposits. The animal was then destroyed. The abscess had developed on the posterior face of the liver. There were four smaller abscesses in the left and middle lobes and also in the hepatic structure. The lymphatic glands were enlarged. There was also tubercular peritonitis. Granulations were scattered on the omentum, mesentery, stomach, intestines and diaphragm. One was on the left kidney. The thoracic organs had also tuberculous deposits.—(*Veter Journ.*)

UNUSUAL CASES OF MILK FEVER [*L. M. Magee*].—A cow, advanced in pregnancy, that has gone dry a few days before and is expected to calve in a fortnight, is taken with milk fever and is now in the delirium stage of the disease. The bladder is emptied, and the udder injected with air and the teats ligated for two hours. The next morning the animal is up and in perfect health. She calved a month later. At her next calving she was down again with milk fever, the next day after delivery and with the ordinary same treatment, she recovered on the following day.

In another case, a six-year-old cow; she was found in a field, where she had her calf during the night. She was unable to rise. The usual treatment was applied, and in the afternoon she was able to move to the barn. The next morning she is again prostrated. A gallon and half of urine is taken away from her bladder and the treatment applied again. She got well during the day, but in the following afternoon she had a second relapse. Two and half gallons of urine are taken away from her and she receives the same treatment, which was followed by permanent recovery.—(*Veter. Record.*)

EQUINE PNEUMONIA [*E. M. Perry, F.R.C.V.S.*].—The author had to treat a number of horses in a large stud, some eleven of which had been diseased and five had double pneumonia. These were the sickest and form the subject of this record.

The first of the horses was treated in the usual manner, but unsuccessfully; he died. The second case was severe from the

start. One entire lung was diseased and also the greatest part of the other. Breathing was very distressed, the temperature 105.5° , and as no improvement seemed apparent, notwithstanding the treatment, the author decided to try Nuclein (Parke Davis & Co.). Five cubic centimeters were injected hypodermically. The temperature dropped to 103° the next day. A second injection reduced it to 102° . The animal began to take food and from that time gradually improved and finally recovered.

The three other cases were treated in the same manner and in all the temperature was reduced by Nuclein injections. Another case is also mentioned, where instead of waiting for the critical acne stage of the disease, the injection of nuclein was resorted to at the beginning of the disease and the affection was cut short. A peculiarity is also mentioned in these cases. It is the fact that while the horses had refused the best green food given to them they were willing and anxious to take thistles which were given to them mixed in the grass. The thistles were not fresh, but half dead, as they are usually found in the fields in the early November days.—(*Veter. News.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

CURIOS CASE OF STRANGLES [MM. Boudeaud and Demé]. This horse was four years old and taken suddenly sick. The history of his symptoms and course of his disease is as follows: One morning he is found entirely unable to move in his box. He is dull, depressed, has a temperature of 39.8° , no appetite, respiration accelerated. It is in vain that attempts are made to make him move. Both stifle joints are the seat of a large, warm and painful swelling, which made them look deformed. For four or five days this condition continues. The temperature goes down a little, the respiration remains the same. There is complete anorexia and the swellings are getting somewhat smaller and not so warm. On the sixth day the right hind fetlock is swollen, and there is a slight febrile manifestation. Then the left hind fetlock; those of both fore legs are successfully taken at irregular intervals. The general condition remains

the same and the horse has lost a considerable amount of flesh. On the 20th day severe sore throat with swelling and purulent discharge are developed. The temperature is up to 40.1° and 40.3° . Respiration is 46, and dyspneic. The animal roars loudly. After seven or eight days the symptoms gradually subside and the animal enters in convalescence. This lasted two months and was accompanied with infectious manifestations on some joints.

"The diagnosis and nature of the synovial localizations was suspected on account of the age of the animal and was confirmed by the history of the case. The horse came from a stable where strangles prevailed since several months." The treatment consisted of therapeutic measures: Subcutaneous injections of polyvalent antistreptococcic serum, counter irritation on the articulations and on the throat. Salicylate of sodæ electuaries, fumigations, intravenous injections of tallianine, which did good. Caffeine was administered with strychnia during the convalescence. The hygenic measures were proper use of blankets, good bedding, milk diet and nuclein.—(*Rev. Gener.*)

EPILEPTIC FIT CAUSED BY MOTOR CYCLE [*Dr. Roger, Army Veterinarian*].—While being ridden, a mare is suddenly taken with peculiar symptoms. General shaking of the whole body, eyelids opening and closing over the eyes, which are twisted in the orbits. She can scarcely stand and has to be supported to avoid her falling. She has a tendency to turn in a circle and shows acute nervousness. The author bled her in the jugular vein and as the blood is flowing, the symptoms gradually subside and soon pass away. The mare goes eating.

These manifestations made their appearance a few seconds after the passage of a motor cycle, which passed rapidly very close to the mare. She was so suddenly frightened that she micturated, dropped manure and ground her teeth. This was the only attack the mare ever had. The author is convinced that it was one of epileptiform nature.—(*Rev. Veter.*)

MICROBES IN A SPOTTED EGG [*Mr. Chretien, Sanit. Veter.*].—Looking through an egg by transparency, several dark spots disseminated without any special selective spot are observed. They are spots of dampness, so called. The shell being broken, these dark spots are detected by the presence of marks, intersecting the shell and its lining membrane. Some of these marks are

black and others of chocolate color. The white of the egg is not altered, and the yoke is not adherent to the lining of the shell. The contents of the egg are inoculated to several media and placed in the autoclave at 38° C. The chocolate marks gave rise to a handsome culture of microbes and amongst them an ovoid microbe belonging to the gender *Pasteurella*, which by inoculation to guinea pig was not or at most little pathogenous. The black marks gave also cultures of microbes belonging to the gender *Coli-Bacilli*.—(Hyg. de la Vian. et du lait.)

STEER WITH ECHINOCOCCUS IN THE LIVER [G. Parant].—Four-year-old steer in good condition has tympanitis since four days. For the last twelve months he has had the same trouble on several occasions; but as these attacks subsided by themselves very rapidly, nothing was thought of them. The animal does not seem much disturbed by its condition. His temperature is normal, the nose is moist and his appetite fair. The left flank projects much on account of gases accumulated in the rumen. Tuberculosis is eliminated by negative tuberculin test. Treatment: Aloes and tartar emetic, and nux vomica; frictions of mustard twice a day. No improvement follows. Steer gets weaker, loses flesh and is sent to the butcher. Post mortem: Near the superior border of the posterior face of the liver there is a large abscess full of caseous greyish pus. It is lined by a thick membrane, which is easily removed. It was a big degenerated echinococcus, which pressed against the oesophagus and promoted the tympanitis.—(Repert. Veter.)

COW HAS OBSTRUCTION OF THE POSTERIOR VENA CAVA [P. Chausse, Sanit. Inspector].—This Norman cow, aged six years, was in very good condition and presented all the signs of perfect health. She was slaughtered for butchery. Only the liver presented a rather marked distomatous and slightly sclerous condition. On the level with the course of the posterior vena cava, there was a tumor as big as a man's fist. It was an abscess situated just in the middle of the hepatic portion of the vein. The abscess had pus in its center. Its middle portion was thick, yellow and fibrous and its envelopes made greatly by the fibrous wall of the blood vessel. The posterior vena cava was completely obliterated and the circulation was carried out by the sub-hepatic veins surrounding and which came from the various lobes of the liver. Notwithstanding the disturbance of the circulation of

the organ by such condition the hepatic parenchyma presented no alteration in its color. The cause of the obstruction was the abscess formed in the hepatic tissue as they are often found in bovines.—(*Rev. Gener.*)

HYDARTHROSIS OF THE ELBOW [*P. Valade, Army Veterinarian*].—Twelve years old, this horse is very lame on the left fore leg. He walks with great difficulty, drags his toe and carries the leg in abduction. At rest, the knee is bent forward, the phalanges flexed, the scapulo-humeral angle is quite open and that of the forearm flexed. The extensor muscles of the forearm are atrophied. The case appears as one of incomplete paralysis of the radial nerve. The next day it is observed that there is a swelling situated in front of and a little below the point of the olecranon in which fluctuation is detected by pressure. Aseptic puncture is made and 80 c.c. of synovia are extracted. This simple operation was followed by an improvement well marked by the actions of the horse. But this was only of short duration and after a few days another puncture had to be made, removing again 60 c.c. of synovia. Again the same result was obtained. Relieved for a few days, only the lameness returned as severe as before; and more severe treatment with deep pointed firing was then applied and at last followed by recovery in a month.—(*Rec. de Medec. Veter.*)

INTESTINAL INVAGINATION IN A DOG [*A. Bouquet*].—Watch dog, one year old, very lively and caressing, has lost his appetite since ten days. He has mucous bloody diarrhoea, very offensive. There is also violent tenesmus. His nose is moist; there is no fever, and abdominal palpation is not painful. Treatment: granules of morphine and strychnine, milk and vichy water diet. After five days of this therapy no improvement. With the tenesmus is added slight prolapsus of the rectum. The condition grows worse. The tenesmus continues, the prolapsus increases; there is some vomiting, and finally as there seems to be no chance to cure him, the owner asks to have him destroyed. At the post mortem there was found general anemic condition, and in opening the abdomen a kind of sausage-like body was exposed. Situated in front of the cæcum it was made of a portion of the small intestine, containing another which was invaginated with its mucous membrane very thick, red, ecchymosed and ulcerated in some places. The diagnosis had been mislaid by

the absence of the ordinary symptoms of invagination, viz., constipation, vomiting of fecal matter, no puffiness nor pain on examination of the abdomen.—(*Rec. de Medec. Veter.*)

TOO MANY FIGS KILL THE COW [*Mr. A. Castelet*].—Three years old, and eight months pregnant, this cow one evening after her supper got loose and went in a field where a large quantity of figs were drying. She tasted them, liked them, and ate many. The effects were rather disastrous, as she was taken with severe tympanitis. Placed under treatment, the gases subsided and the cow was somewhat comfortable. But the next day she showed alarming symptoms: staggering walk, viscous discharge escapes from the nose and mouth, the pulse is weak and thready, the body is cold, there is no rumination and the animal moans with pain. Treatment is useless, death takes place. Nothing of interest was found at the autopsy, except that the rumen contained between 13 and 15 kilogrammes of figs fermenting and giving enormous quantity of carbonic acid gas.—(*Prog. Vet.*)

ANNO DOMINI.

Minister's son disappeared from the parental roof. Was gone two years, then returned. Told his father he had been studying veterinary medicine. Father disappointed and remarked:

"What! a horse doctor! I intended you, my son, for a more refined calling."

"Well, father, I like it. Have great sympathy for dumb animals and the establishment of veterinary colleges in various parts of the country will extend great advantages to students."

"Well," said the father, "I suppose I shall have to accept the situation. By the way, my parishioners gave me a horse the other day. I would like to have you examine him."

The boy gave the horse one glance and said:

"Father, he is not much of a horse!"

"Well," said the father, "we must not criticise a gift too closely. I have no doubt he is as fine an animal as our Saviour rode into Jerusalem."

The boy opened the animal's mouth and exclaimed:

"Yes, father, I think it is the same one!"—(*The Rider and Driver.*)

CORRESPONDENCE.

TO MEMBERS OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

The American Veterinary Medical Association is now in the forty-eighth year of its existence. From this time on until the fiftieth anniversary we should lend every effort to add strength and efficiency to the organization, in order that we may with greater zeal and satisfaction enjoy the half-century retrospect.

During this time the evolution of the veterinarian, and all that pertains to his education and standing, are without precedent. Let us keep right on fighting for our cause until we receive the recognition in the army and elsewhere that is our due.

It seems to me that the principal things we should strive for at this time may be conveniently classed under five heads:

1.—Let us get together—in union there is strength. There is a comparatively small proportion of eligible veterinarians now members of our association. We meet next time in a populous country and will no doubt have a large attendance. A large number of veterinarians will be eligible next year under the five-year clause. Remember that applications for membership must be filed with Secretary Marshall thirty days before the meeting, which will be on August 22-25 at Toronto, Canada. Each Resident State Secretary accepts his appointment with the understanding that he is to make a special effort to secure new members, and to facilitate the work of Secretary Marshall, is expected to proceed at once to secure a list of eligible veterinarians in his state and forward same to Dr. Marshall.

2.—There has been a general complaint, and many practitioners have refused to join the A. V. M. A. because we never have time for discussion of practical things. In making our program this year let us keep this object in view. It will do no harm to try it once. In the conduct of our meeting next August, it is hoped that every member will try and aid the chair-

man to so facilitate business that we may have more time for discussion of common diseases and their treatment.

3.—We have a strong committee on legislation, and it is hoped that every member will make it a point to aid them by "seeing" congressmen and bringing all influence possible to bear in the interest of our army legislation bill.

4.—In the matter of uniformity of degrees, it is absurd having so many degrees all meaning the same thing. Let us resolve to be magnanimous in this matter, and say that we will make the change if the majority vote for some other degree. The cost would be only nominal; the price of a new stone for printing diplomas in some cases. The objections, with selfishness eliminated, are not serious..

5.—The weak link in our veterinary college education is matriculation requirements. The curriculum is very satisfactory for the present; the college year is being extended in some schools and in others an additional year is contemplated. Why not raise the educational standard for matriculation? Not a radical change that would work a hardship, but something commensurate with the standards we have attained in other respects.

These are the things that especially appeal to me, and whether we accomplish much or little, we have at least tried to crystallize some of the things talked about, and I confidently trust in a hearty co-operation of all, that we may attain "the greatest good for the greatest number."

Cordially yours,

GEO. H. GLOVER.

AMES, IOWA, January 9, 1911.

Editors AMERICAN VETERINARY REVIEW, New York, N. Y.

MESSRS.—Under the heading of Bibliography in your December, 1910, issue, you gave a review of "A Text-book on Disease-producing Micro-organisms," especially intended for the use of veterinary students and practitioners, by Maximilian Herzog, M.D. I beg that you give me enough space for what I believe to be a just criticism of this text. The author and

publishers deserve much credit for the mechanical make-up of the text. The illustrations are excellent, fully equal to those used in any text in bacteriology which has been published; among these should be mentioned particularly the cuts illustrating pathologic lesions of specific diseases. The effort to place before English reading veterinary students a text on micro-organisms is most commendable, and the work is, on the whole, well done.

A book to be of service to a student as a text, or to a practitioner as a reference work, must have its subject matter arranged according to some logical system. It should be free from numerous or vital errors, and dogmatic statements; and should treat the *one* subject in a scientific manner. One of three methods of classification might be used, bacteriological, pathological, or preferably the first, but not a mixture of all of them. Further, in a discussion of disputed or unsettled points, the different views should be given. A careful study of this book reveals that this has not always been done. We have had enough poorly and quickly written text books already in veterinary medicine without having any more thrust upon us.

The following comments will, I believe, vindicate these statements: Page 22, par. 1. This is rather puerile for a scientific text for college students, but would make a good introduction to a first lesson in kindergarten work.

On page 25 there is a statement under "Symbiotes" to the effect that in the vagina are to be found acid-producing organisms which prevent infection. Such a condition cannot be one of symbiosis, as an acid reaction destroys spermatozoa.

On pages 24 and 25 the forms "Commensales" and "Symbiotes" are used instead of the commonly accepted *English* forms of commensals and symbions or symbionts.

Page 26, par. 2. Bacteria are said to be closely related to higher fungi, the adjective higher is scarcely correct, as the bacteria are believed to be more closely related to the *lower* fungi.

Page 36, under the heading "Arthrospheres" is given a list of pathogenic bacteria producing spores: This should not be included here, as their spores are not arthrospheres but endospores.

Page 38, the noun "Thermophil" is used as an adjective.

There would appear to be no logical reason for treating infection, phagocytosis and opsonins in the same chapter and following with a chapter on antibodies. Opsonins and phagocytosis belong with a consideration of antibodies and immunity. The discussion of each topic is in the main excellent, but the arrangement is so illogical that it surely will lead to confusion in the mind of the student. Pages 78 and 79, in discussing the Wasserman test for syphilis in man, the author says: "Since the same principle *may be applied* to diseases of domestic animals," and further "the author has for some time tried to find a chance to apply *his test* to Dourine of horses." It might be well to mention that complement deviation as shown by inhibited hemolysis in a similar procedure with Dourine has already been demonstrated by Landstiner, Möller, Pötzl, Hartoch and Yakimoff.

Pages 193-194. "Wounds, however, which are received under natural conditions, will suppurate unless they are immediately cleansed with antiseptic solutions and dressed to exclude the air and other possible sources of contamination" and it (pyemia or septicopyemia) is *more dangerous* than a septicemia, and recovery is relatively rare. Most practitioners can from their own experience flatly contradict these statements.

Page 195. "The staphylococci, particularly the staphylococcus pyogenes aureus are the causes of all varieties of wound infections such as septicemia, pyemia, endocarditis, septic pneumonia, puerperal fever, bone diseases, etc." Page 198. "The streptococcus pyogenes is the cause of suppurative processes of all kinds, such as septicemia, pyemia, puerperal infection, erysipelas, etc." If these statements are not in conflict, they are at least ambiguous, and must lead to confusion on the part of the student. Page 218, par. 1. This is badly mixed, and the citations are not all correct. Prof. Moore found a bacillus of the haemorrhagic septicemia group instead and believes the etiology of roup unknown.

Page 321. The author describes Ostertag's streptococcus of abortion in mares as a "short immobile, gram-negative streptococcus," which is ambiguous; is it the single organisms or chains that are short? The bacteriologist would know, of course, but would the student?

Page 366. While such statement is not definitely made, the chapter heading nevertheless gives the impression that pseudo-

tuberculosis is caused by acid-fast organisms, while they are not even grampositive. Acid-fast organisms other than the bacterium tuberculosis are described in the same chapter. The writer fails to find any logic for such ambiguous headings or such a system of classification. Pages 374 and 375. In discussing Johne's disease under heading of pathologic lesions, the author says: "If, however, the disease has been recognized early by microscopic examination and inoculations," and "attempts to cultivate the bacillus, as well as animal inoculations, have so far been unsuccessful." These statements do not agree, and it should have been made clear in the first statement that negative results would follow attempts of inoculation.

Page 379. The author says "whether every case of contagious pneumonia of horses is always due to equine influenza, *i. e.*, to the bacillus bipolaris equisepticus." This does not harmonize with the following statement on page 230; "Hutyra has confirmed the observations of Ligniere, identifying the bacillus equisepticus as the cause of horse influenza, or pink-eye, but other authors still consider the etiology unsettled, and doubt whether this organism is the actual cause." From the latter statement one must believe the etiology of equine influenza unsettled, while the former statement says definitely that it is the bacillus bipolar equisepticus.

Page 399 under the heading of spore formation under number 4. Chlamydspore and gemmæ are synonyms.

Chapter 36 has as a part of its heading "Streptothrix" and "Actinomyces." The two genera, if there are two, are not adequately differentiated; the latter heading is not discussed in this chapter, but in the following.

Chapter 41, the term "Hoof and Mouth disease" should be Foot and Mouth disease. The *hoof* is dead material and can not be diseased; the nomenclature, however, is given correctly on page 445.

Is a discussion of *soil bacteriology* pertinent in a veterinary text?

This by no means completes the list of criticisms that might be offered. They may be summarized in the statement that in many places the arrangement is illogical, like things are not grouped together and that there is need of a systematic elimination of irrelevant material.

This communication is written in the hope that text-books for veterinarians may be written as carefully and as accurately as other books; in order that students and instructors may not find it necessary to look up their subject matter in other works to determine their accuracy, before taking the author seriously.

Very truly yours,

H. S. MURPHY,
Assistant, Veterinary Division, Iowa State College.

HOW OFTEN SHALL HORSES BE FED?—Recently there has been quite an agitation in Seattle over the decision of a prominent transfer company to discontinue the noonday meal of their horses. This decision has brought forth a storm of protest from the drivers, which ended in a general strike of all the teamsters employed by the company.

The subject of how often and how much working horses should be fed is an old one and one on which there is no end of opinions. Nearly all concerns using a large number of teams have their own system of feeding, with rarely any two alike. That many working horses are overfed most of us know, and that many are underfed none will doubt who will stand on the street corners for a short time and watch the passing teams. The system and the amount fed should, as a rule, be determined by the kind of work the horse is doing and the length of time he is allowed after eating to digest his food before resuming work. Horses working eight or ten hours a day are certainly entitled to a midday feed and should have it, providing it is not too heavy and they have half an hour or more rest after eating. Horses should always be watered before feeding and never immediately after. It is most injurious to digestion and is often the cause of colic to allow a horse to drink heavily on a full stomach of grain.—(*Horn and Hoof.*)

OBITUARY.

ARCHER E. PARRY, D.V.S.

Born at Ft. Laramie, Wyoming, about fifty years ago, and living his early life in that state and Colorado, Dr. Parry came to New York in 1887 and entered the American Veterinary College, from which institution he subsequently graduated, receiving the degree of Doctor of Veterinary Surgery. With the exception of the first few years after graduation, when he lived and practiced at Riverhead, L. I., he has practiced in New York City; for some time attending the horses of the Police Department. At the time of his death, he was veterinarian to the United States Army horses stationed at Governor's Island.

Dr. Parry was first taken sick two years ago, but apparently recovered after a year out of practice, and for the past year had resumed his work. He died at the Flower Hospital on December 12th last, where he had been removed a few hours prior to his death, having been suddenly seized with uremic convulsions after returning from an entertainment with his family. The Doctor was a member of Mecca Lodge, Mystic Shrine, Chancellor Walworth Lodge, F. and A. M., Columbian Commandery, and Floral Chapter of the Eastern Star. He also was a member of Roanoke Lodge, Oddfellows, and Queensboro Lodge, Elks. After Masonic services at the Masonic Temple, New York City, he was buried in a Shriner's plot at Kensico. Dr. Parry is survived by a wife and three daughters, the youngest of which is fifteen years old.

DAVID S. JOHNSON, D.V.S.

Dr. David S. Johnson, graduate of the New York-American Veterinary College, class of 1901, died at his home in Hartsdale, N. Y., of pneumonia, on January 10. Dr. Johnson, who was a son of Dr. Samuel K. Johnson, chief veterinarian to the Health Department of New York City, was twenty-nine years old at the time of his death. He leaves a widow.

DR. JOSEPH R. SHAW, of Los Angeles, Cal., died on December 23 last. We learned no details in connection with his death.

SOCIETY MEETINGS.

SOUTHERN ILLINOIS VETERINARY MEDICAL AND SURGICAL ASSOCIATION.

This association met in regular annual session at the City Hall, Centralia, Ill., January 3 and 4, 1911. The regular order of business was transacted.

The election of officers for the ensuing year resulted as follows:

President.—Dr. W. H. Cox, Mason, Ill.

First Vice-President.—Dr. E. E. Downing, Farina, Ill.

Second Vice-President.—Dr. T. M. Treece, Herrin, Ill.

Secretary.—Dr. Frank Hockman, Louisville, Ill.

Treasurer.—Dr. Geo. J. Otke, Aviston, Ill.

The following program was carried out:

Tuesday, January 3.—10.00 a. m., Order of Business; Noon Adjournment; 1.00 p. m., President's Address; 2.00 p. m. "Inflammation of the Liver," Dr. W. H. Cox, Mason; 3.00 p. m., "Inflammation of the Brain," Dr. Wm. Smith, Findlay; 4.00 p. m., "Honesty," Dr. E. E. Downing, Farina; 5.00 p. m., "Cancer in Cattle," Dr. F. Hockman, Louisville; Adjournment; 7.30 p. m., Round Table.

Wednesday, January 4.—8.00 a. m., "Rumenitis," Dr. J. B. Crowell, Marion; 9.00 a. m., "Parturient Apoplexy," Dr. G. J. Otke, Aviston; 10.00 a. m., "Tetanus," Dr. E. Holcomb, Smithton; 11.00 a. m., "Canine Distemper," Dr. W. A. McMillian, Centralia; Noone Intermission; 1.00 p. m., "Azoturia," Dr. J. C. Jean, Lick Creek; 2.00 p. m. "Obstetrics," Dr. W. H. May, Nashville; 3.00 p. m., "Dentistry," Dr. F. M. Dillman, Sailor Springs; 4.00 p. m., Adjournment.

The Committee on Arrangements reported the next meeting to be held at the City Hall, Centralia, Ill., August 1, 2 and 3, 1911.

FRANK HOCKMAN,
Secretary.

B. A. I. VETERINARY INSPECTORS ASSOCIATION OF CHICAGO.

The regular monthly meeting of the above association was held on the evening of January 13, 1911, at the "Saddle and Sirloin Club."

Thirteen new members were admitted to active membership.

The association voted to hold the annual banquet on Saturday evening, February 11, 1911, and a committee of arrangements was appointed.

The paper of the evening was presented by Dr. L. E. Day, of the B. A. I. Pathological Laboratory of Chicago. The subject was, "Methods of Infection by Tuberle Bacilli."

The paper evoked quite a general and interesting discussion which was participated in by most of the members.

The next regular meeting will be held the second Friday evening in February at the same place and hour, 8 p. m. At this meeting the annual election of officers will be held.

H. A. SMITH,
Secretary-Treasurer.

RESIDENT SECRETARIES—A. V. M. A.

1910-1911.

UNITED STATES.

Alabama.—I. S. McAdory, Auburn.

Arizona.—J. C. Norton, Phoenix (Arizona and New Mexico).

Arkansas.—R. R. Dinwiddie, Fayetteville.

California.—David F. Fox, Sacramento.

Colorado.—I. E. Newsom, Fort Collins.

Connecticut.—G. W. Loveland, Torrington.

Delaware.—H. P. Eves, Wilmington.

District of Columbia.—R. P. Steddom, B.A.I., Washington.

Florida.—Thomas J. Mahaffey, Jacksonville.

Georgia.—Wm. A. Scott, Columbus.

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- Idaho.—Frank W. Chamberlain, Moscow.
Illinois.—L. A. Merrilat, Chicago.
Indiana.—J. W. Klotz, Noblesville.
Iowa.—Wm. W. Dimock, Ames.
Kansas.—Kirk W. Stouder, Manhattan.
Kentucky.—F. E. Eisenman, Louisville.
Louisiana.—H. G. Patterson, New Orleans, La.
Maine.—A. Joly, Waterville.
Maryland.—Wm. H. Martenet, Baltimore.
Massachusetts.—Francis Abele, Jr., Quincy.
Michigan.—Thomas Farmer, Grand Blanc.
Minnesota.—L. Hay, Faribault.
Mississippi.—James Lewis, Agricultural College.
Missouri.—F. F. Brown, Kansas City.
Nebraska.—P. Juckniess, Omaha.
Nevada.—W. B. Mack, Reno.
New Hampshire.—F. A. Allen, Nashua.
New Jersey.—J. P. Lowe, Passaic.
New Mexico.—J. C. Norton, Phoenix, Ariz. (Arizona and
New Mexico).
New York.—John F. De Vine, Goshen.
North Carolina.—Adam Fisher, Charlotte.
North Dakota.—W. F. Crewe, Devil's Lake.
Ohio.—E. H. Shepard, Cleveland.
Oklahoma.—Robert A. Phillips, Oklahoma City.
Oregon.—W. Dean Wright, Portland.
Pennsylvania.—H. Preston Hoskins, Philadelphia.
Philippines.—G. E. Neson, Manila.
Porto Rico.—T. A. Allen, San Juan, P. O. Box 541.
Rhode Island.—T. E. Robinson, Westerly.
South Carolina.—L. Friedheim, Rock Hill.
South Dakota.—J. P. Foster, Huron.
Montana.—A. D. Knowles, Livingston.
Tennessee.—M. Jacobs, Knoxville.
Texas.—Mark Francis, College Station.
Utah.—H. J. Frederick, Logan.
Vermont.—F. A. Rich, Burlington.
Virginia.—George C. Faville, Norfolk.
Washington.—Logan B. Huff, Spokane.
West Virginia.—L. N. Reefer, Wheeling.
Wisconsin.—W. G. Clark, Marinette.
Wyoming.—Otto L. Prien, Laramie.

CANADA.

Nova Scotia.—William Jakeman, Glace Bay.
Alberta.—J. C. Hargrave, Medicine Hat.
British Columbia.—S. F. Tolmie, Victoria.
Saskatchewan.—D. S. Tamblyn, Regina.
Manitoba.—F. Torrance, Winnipeg.
Ontario.—F. C. Grenside, Guelph.
Quebec.—M. C. Baker, Montreal.
New Brunswick.—D. McCuiag, McAdam Junction.
Prince Edward Islands.—W. H. Pethick, Charlottetown.

SOUTH AMERICA.

Uruguay.—D. E. Salmon, Montevideo.

AUSTRALIA.

Australia.—J. Desmond, Adelaide.

WESTERN CANADA NOTES.

Many veterinarians on the plains of the Canadian Northwest will regret to learn of the passing of Inspector Harry Ayre, of the Health of Animals, Regina. A Yorkshireman, the son of a doctor, he came to Canada at his majority and took service with the Royal Northwest Mounted Police, seeing the varied work of that admirable force as far north as the Yukon. In the force he attained to the rank of Veterinary Staff Sergeant, and on completion of twenty-five years' service was given the King's long service medal for faithfulness to duty. He was then transferred to the head of a branch about three years ago. An unfortunate driving accident last summer had its sequel in tetanus superinduced on an operation to remove a limb. A Chapter Mason and Anglican, he was noted for his fidelity to friends and duty. He will be sincerely regretted by all who knew him, and sympathy is hereby extended to his wife in her lonely widowhood.

The Veterinary Association of Saskatchewan at the suggestion of one of its members, Dr. A. G. Hopkins, gives its paid-up members the option of a year's subscription to a professional journal. The idea underlying this scheme is two-fold—to induce the reading and studying habit in many who would not

bother to send for a journal, but who will read it with interest if at hand, and also to give the practitioner at a distance some return for his annual fee, the cost of traveling very often precluding attendance at conventions.

It is expected that examinations for the license to practice in Saskatchewan will be held early in the spring. Intending candidates should communicate with Dr. J. J. Morrison, Areola, Sask., for information of the sittings of the board of examiners. At the last sitting three received the license, ten taking the examination. The lure of the West had it appears caused some of the old and out-of-date practitioners from down East to think Saskatchewan a good place in which to start over again. No objection is made to this, only the public must be protected against inferior and poorly educated men—hence the rejections.

Several changes have occurred in the Health of Animals staff in Saskatchewan, the inspector in charge, Dr. A. G. Hopkins, relinquishing official work to manage his farm and give personal attention to his live stock breeding interests.

The usual grist of letters is being received at Regina from intending settlers and their home practitioners asking for information re the passing in of live stock at the Canadian ports of entry. All inquiries should be sent to the Inspector-in-charge, Health of Animals, Regina.

KING'S VETERINARY SURGEON.—Professor W. Owen Williams, of the Veterinary School, University of Liverpool, has been appointed by the Earl of Granard, Master of the Horse, veterinary surgeon to the establishment of His Majesty's stables. Professor Williams held a similar appointment to the late King Edward. —*The Rider and Driver.*

AMERICAN live stock is the leading factor of Agricultural prosperity, and the improved breeds have added wonderfully to the prosperity of the nation. Of our entire agricultural production of \$9,500,000,000, our live stock is \$6,000,000,000. The value of horses alone on farm and in the cities is \$3,500,000,000, and that of cattle, sheep and hogs, \$2,500,000,000.—*Live Stock Journal.*

NEWS AND ITEMS.

DR. JAMES L. ROBERTSON, New York, has returned from Ohio much improved in health.

DR. GEO. H. GLOVER attended the annual banquet of the Iowa State College held in Denver, Colo., Dec. 31, 1910.

DR. F. W. CHAMBERLAIN has been called from Moscow, Idaho, to the chair of anatomy at the Veterinary Division of the Michigan Agricultural College, at East Lansing, Mich.

DR. W. R. O'NEIL and son, of Monrovia, California, were met with the misfortune of being bitten by a rabid dog during Christmas week and are taking Pasteur treatment at Los Angeles.

DR. WALTER W. STEWART, Chihalis, Wash., graduate class 1910 Division of Veterinary Science, Colorado State College, was united in marriage to Miss Bessie Littler, Ft. Collins, Colo., on December 28, 1910.

HOG cholera is so prevalent in the hog raising districts of the Middle West that the serum departments of the biological houses and the state experiment stations have not been able to supply enough serum to cope with the demand.

DR. ROBT. J. FOSTER, veterinarian Twelfth Cavalry, left Ft. William McKinley, P. I., with his regiment for the United States on January 14th. Later advices are to the effect that they will be stationed at Fort Robinson, Neb.

DR. W. HORACE HOSKINS, Philadelphia, fell on the ice on Christmas eve and broke his ankle. This is the first time the doctor has been confined to his bed in thirty years. When we last heard from him he was going about on crutches.

DR. CHARLES C. GOENTNER of the class of 1881, American Veterinary College, died in Philadelphia, January 3d. Through the efforts of his classmate, Dr. W. Horace Hoskins, a floral offering was made by the A. V. M. A., Pa. State Vet. Med. Ass'n and the Keystone Vet. Med. Ass'n; in all of which he was an active member, being a charter member of the last-named organization.

AT the annual meeting of the Veterinary Medical Association of New Jersey at Trenton, January 12th, Dr. Thomas B. Rogers, of Woodbury, was elected president. The other officers were re-elected. This choice of a chief executive for the coming year will undoubtedly increase the activity of the organization. The July meeting will be held at the Agricultural College, New Brunswick.

AT the last meeting of the Central Society of Veterinary Medicine, Paris, Professor Lautard was elected to the presidency of that organization. The veterinary profession of America conferred every honor upon Dr. Lautard that was within its gift, during his many years of labor for the elevation and advancement of the profession in the United States, and rejoice anew in this latest recognition from his fellow citizens in France.

THE Veterinary Conference held at the New York State Veterinary College at Ithaca in January proved to be the best of the series. The presence of Principal Grange, of the Ontario Veterinary College, Dean Klein, of the Veterinary Department of the University of Pennsylvania, and Dr. John R. Mohler, Chief of the Pathological Division of the B. A. I., added much to the attractiveness of a program already rich and instructive. Each of these gentlemen gave most excellent addresses.

THE third annual reunion and smoker given by the Veterinary Medical Association of New York City on January 18th was a marked success and completely eclipsed the two previous ones. Eighty-six men sat at the festive board and were entertained in a manner that was thoroughly enjoyed and appreciated. The committee, of which Dr. Charles E. Clayton was chairman, are deserving of much credit, and should be continued indefinitely as an entertainment committee, as they have demonstrated their peculiar adaptability in that direction.

AMERICAN VETERINARY REVIEW.

MARCH, 1911.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, January 15, 1911.

COPROLOGY IN VETERINARY MEDICINE.—Since about fifteen years numerous researches have been made from the scientific as well as from the clinical point of view, of the chemical composition of feces and on their bacteriology; and the results which have been obtained have helped to solve many obscure phenomena relating to assimilation in the normal state and in diseases. Coprology has then, to the same extent as urology, become a mode of clinical investigation by which valuable indications have been obtained, not only for the diagnosis, but also the prognosis and treatment of some diseases.

In veterinary medicine, the analysis of urine is part of the daily investigations of the veterinarian; by opposition the chemical examination of feces has never been carried out in a systematic manner. The veterinary practitioner, most ordinarily stops with the observation of the form of the anal droppings, their consistency, their color or their nature. And yet the problem of the general nutritive function is of as great importance in animals as it is in man. But it is so difficult in our practice, in the clinical sense of the word, that its consideration is almost impossible.

It is, however, with this object in view that a veterinarian, Dr. Cozette, has thought proper to work up the question and examine what practical application, at least, could be obtained. In a communication before the Société de Pathologie Comparée he has brought the question of the "Importance of the Biliary Function from the Point of View of the Diagnosis and of the Prognosis of Diseases in Domestic Animals"; in which he first passed a review of the biliary secretion and where he points out the importance that belongs to the study of the presence of stercobiline in the pathological condition of an animal. He examines the troubles of the biliary function which may be modified in quantitative as well as qualitative conditions and tells of the method by which stercobiline and biliary pigments can be looked for in fecal matters.

The simplest way being to dilute approximately 1 c. c. of the matter in 15 to 20 c. c. of distilled water, to stir the mixture well to make it thorough and then to add from 8 to 10 drops of acetic sublimate. Stir it again and put the tube at rest. From half to one hour after a very noticeable reaction will be obtained, viz. a variable coloration most significant and which will give immediately valuable information, not only upon the biliary function itself, but also upon the intestinal function of the subject under examination. For instance, a tube with white greyish precipitate and a colorless liquid indicates acholy; one with yellow or yellow-greenish contents indicates the presence of biliverdine, and tubes with green coloration means bilirubine. One with yellow-reddish indicates stercobilinogene and tubes with rosy coloration varying between the rosy-purplish and the deep red reveals stercobiline.

These researches and the results thus recorded by Dr. Cozette are the confirmation of facts entirely similar in human pathology. In physiology and in pathology, the bile plays a part which could be fully appreciated by taking into consideration the so remarkable development of the hepatic gland in the animal series. If there is no physiological biliary secretion, no proper nutrition, no assimilation can take place. With an acute disease, with no se-

cretion of bile or with diseased bile, the vitality of the individual is lost or compromised in various degrees, if in presence with an infectious disease or of its microbian or toxic effects.

Dr. Cozette has completed his researches by a series of experiments upon dogs, pigs and calves. With the two first class of animals he has followed the biliary function in both ways from the normal function to the acholy and vice versa and he has found that the presence of stercobilin and even of biliverdine in the feces were always a favorable sign for a good prognosis. His observations, covering cases of gastro-duodenitis, acute gastro-enteritis, dysenteric enteritis, jaundice, infectious pneumo-enteritis of swine, simple diarrhoea of calves, acute enteritis of ruminants, etc., have given him facts which have permitted his conclusions, viz.: In young animals affected with intestinal diseases the systematic examination of feces by the reaction of the acetic sublimate permits to bring in evidence the value of an important element of vital defence, viz., the biliary secretion.

If this is absent, that is if in the test tube there is a white greyish or white greenish deposit with a colorless fluid, the prognosis will be fatal.

If on the contrary the biliary secretion is still going on and if especially the reaction of stercobilin (rosy, red or purplish) the prognosis will be favorable.

However, perfect as this method appears to be, one must not forget that it is but an accessory means for establishing a prognosis, and that its value remains more or less under the subordination of the minutious examination of the diseased animal. The acetic sublimate reaction can only be of great importance to the practitioner, but it might be dangerous to conclude too hastily to a favorable prognosis, as all diseased subject may still have a normal biliary function and yet die with other physiological disturbance.

At any rate, coprology applied to veterinary medicine may later on prove as interesting as it does in human medicine.



FISTULAS AND THEIR TREATMENT.—A very remarkable case of these ailments has given opportunity to Prof. Hendrick to write an interesting article in the *Annales de Bruxelles*. As the learned professor says: "If we consider the pathogeny of fistulas, we observe that those accidents are generally, if not due, at least kept up by one of the following conditions: Most often at the bottom of the fistulous tracts there is found a small piece of mortified tissue, acting as an infected foreign body and promoting suppurative phenomena in the structures where it remains. Whether it is a small splinter of bone, one of tendinous, ligamentous, cartilaginous or connective tissue, the condition remains the same, viz.: the suppuration continues until by a favorable circumstance the elimination of the irritating cause takes place or that it is removed. This elimination or removal can be the result of surgical interference; but often also it takes place spontaneously, principally when the causal substance is loose or when its dimensions are such that it can be carried away outside by the flow of the purulent discharge.

There are again other conditions for fistulas to exist, as for instance, when they are the consequence of the accidental or intentional introduction of a foreign body from surroundings outside and therefore infected. Or again it is a deep wound which does not heal and becomes fistulous because of the existence of a certain part, in the depth of the tissues, of a purulent collection situated on a lower plan than the external opening of the fistula and which as a result cannot empty itself entirely; the accumulation of the pus then becomes the condition that keeps up the fistulous tract, because the discharge goes on only when the purulent sac being full allows its escape. Generally, but few are the fistulas which have not such origin and the general therapeutics of these accidents is easily indicated. The artificial elimination of the foreign body by any of the known surgical means, or in some special cases facilitate the escape of the pus by the free incision of the fistulas down to the seat of the cause or by a counteropening or again by draining of the tract.

There may, however, be cases, even if they are rare, where these ordinary means of treatment cannot find their applications. Prof. Hendrick relates one of pelvic fistula in a mare which has given him the opportunity of resorting to a mode of successful treatment deserving publicity.

The case described at some length by the professor can be resumed concisely. A mare had a difficult parturition and the next day an enormous swelling had taken place on the right side of the hind quarters, the croup, the thighs, perineum, leg, mammae and lower abdominal regions were invaded. Vaginal exploration revealed a large hematoma and a wound of the mucous membrane on the right side of the vagina. After a few days, fluctuation was detected below the vulva; it was tapped the hematoma of the vagina became suppurating, and by the introduction of the hand into the vaginal cavity a circular wound with indurated edges was detected on the right wall. This wound was continued with a tract 41 centimeters long, which ran downwards and towards the anterior border of the pubis. A probe was introduced in the tract, and as it seemed impossible to locate the bottom of the fistula and make a counter opening, the probe was secured by two stitches, with the intention to use it to carry on the treatment.

Thorough washing, injections of permanganate of potassium, peroxide of hydrogen, chloride of zinc, Van Swieten solution, all were successively tried, but after one month the purulent discharge was as abundant as the first day by the vulva and by the perineal wound.

It was after those failures that Prof. Hendrick made another attempt which at last was successful.

"He took 20 grammes each of white wax and of paraffine, added 120 grammes of sub-nitrate of bismuth and mixed them with 240 of white vaseline. As at the ordinary temperature, this mixture gets quite hard, it is necessary so as to inject it with a syringe, to place it in a basin with hot water, and have the contents at about 45° C. Then the mixture is syrupy and

can be drawn in the syringe which is itself heated at the same temperature. The injection can then be readily made."

This was done with the fistula of the mare. After 24 hours the tract was transformed into a hard cord-like, formed by the mixture which had become hard at the temperature of the body. The discharge gradually diminished. The animal showed no annoyance by the treatment. Her general condition improved and ten days after all pus had stopped. There was no more discharge and the recovery was complete and lasting.

Whatever was the action of the medicines composing the mixture, the results were certainly very satisfactory and may receive their logical explanation by further experiments. At any rate, it is but the application of a method which is known as the Method of Beck, and which has already been employed and recorded by our American confrère, Doctor Leshe.

It is certainly worth knowing; to be used in other similar instances.

* * *

INTESTINAL OBSTRUCTION IN CATTLE.—Professor Mossu states that colics in bovines are generally manifested by such characters that they can be classified in two distinct groups: those by congestion and those by intestinal obstruction. This second group is far the most important, involving as it does the accidents due to invagination, strangulation, obstruction and torsion of the intestines. They are all extremely serious and ordinarily end in death, unless a surgical operation interferes or an exceptionally fortunate hazard comes at the proper time to remove the obstacle to which is due the arrest of the progress of the alimentary products.

With the exception of the pelvic strangulation in males and the very cases where the location of the invagination can be established, there is always an existing doubt as to the cause of the intestinal obstruction. The diagnosis of the trouble is not difficult, as after all the great symptomatology tells it quite plainly: the sudden apparition of very violent colics of variable

duration, generally several hours; complete anorexia for any kind of food; total arrest of defecation after the time necessary for the evacuation of the contents of the intestines in the part situated beyond the point of obstruction say 12 or 24, or 36 hours; general prostration with a lowering of the temperature; depression of the pulse; loss of strength; semi-comatose condition; sinking of the eyes in the orbits; general loss of sensibility.

To those general common symptoms may be added other secondary manifestations; tympanitis more or less severe, localization of pain in a given region of the right flank, gurgling more or less loud in the pre-iliac region, bloody mucuses expelled after hard efforts for defecation, careful laying down, etc., etc.

But with all those, it is not possible to localize the spot of the obstacle causing the obstruction. Only an exploring laparotomy would permit such a solution; but is a step which would be admitted only under very exceptional conditions. If one was sure that the intestinal obstruction was due to a simple twisting, to a strangulation, perhaps a surgical interference would suggest itself. But there are so many conditions and economical reasons in veterinary practice that practitioners will almost always decline to assume the responsibilities of an attempt.

As besides all that, there may be some extraordinary conditions of origin, so unexpected or so particularly singular that the fatal ending of the case could not have been avoided. This indeed is well illustrated by the case which called for these remarks published in the *Recueil* under the heading of "Repeating Intestinal Obstruction."

It was in an aged cow which had to all appearance always been in good health and which was suddenly attacked with colics, which, with the other manifestations, left no room for doubt in the diagnosis. It was a case of intestinal obstruction with undiscovered cause, and a fatal issue was looked for, although the author had known of one case of invagination, where the patient

remained 21 days sick and without eating and finally recovered by the spontaneous elimination of the invaginated intestines.

The cow presenting all the symptoms was placed in observation and without treatment. After a few days the condition of her bowels improved, feces became less offensive, general bad condition subsided some, and recovery seemed possible. But after ten days new symptoms of intestinal obstruction returned and notwithstanding strong purgatives, the animal died without the cause of the intestinal trouble being suspected.

The post mortem gave the explanation. The abdominal organs were free from lesions, but at the level of the stoppage of the alimentary contents there was a slight strangulation of the intestines and by palpation a hard elongated body was detected closing the cavity of the bowels. It was the cause of all the difficulty. "It was a polypus, a myoma, measuring ten centimeters in length having a peduncle at its anterior end, and free in the entirety in the intestinal canal, which he obliterated almost entirely. Its attachment on the small curvature had given rise to the slight strangulation of the intestine with a limited twisted motion of the two segments, above and below, of the bowel."

It is easy to understand how by this condition of the polypus, obstruction would repeat itself at various intervals according to the position and the displacement that it might assume. And it is also admissible that these similar repeated occurrences of colics had already taken place and possibly were overlooked. At any rate it is a new possible cause to be added to the long list of those of intestinal obstructions.

* * *

CUTANEOUS CANINE FILARIOSES.—This name, applied to the disease produced by the presence in the circulatory apparatus of dogs of the *Filaria Immitis*, has been recently the object of a publication in the *Clinica Veterinaria* by Doct. Domenico Zibordi, adjunct professor to the school of Milan.

First, in a kind of introduction to the subject, the doctor relates the fact that while the disease is an exotic affection, proper to Japan, China, Tonkin, India, North and South America, it must also be remembered that Europe is not exempt from it and that cases have been recorded in almost every country of Europe. He then gives a concise résumé of the common seat where the adult parasite is found, viz.: in the right heart, more frequently in the ventricles than in the auricles, in the subcutaneous and intramuscular connective tissue, not unfrequently in the pulmonary artery and vena cava and their ramifications, and exceptionally in the left heart and the arteries of the great circulation. Embryos of the parasites are always found in the blood.

After this concise consideration relating to the seat of the disease, Prof. Zibordi makes a very long excursion into the bibliography that he has been able to review. While it is to Delafond and Gruby that belong the merit to have in 1843 demonstrated the presence of embryos circulating in the blood of a dog, which had adult worms in the heart and large surrounding blood vessels and again gives credit to Rivolta for having first recorded a case of cutaneous filaria manifested by the presence of an herptic eruption on the neck of a dog, in which by microscopic examination, the crusts of this erupton were found full with filaria. He then alludes to the many cases recorded by Silvestre, Oreste, Ercolani, Galtier, Rivolta, Lanzillotti, Buonsanti, Siedamgrotzky, Shattch, Earl, Nogueria, Deffle, Wright, Raillet, Rosso, Nazzanti and many others and he mentions the seat where adult worms were found at the post mortems of the dogs affected: (heart large blood vessels, pulmonary, cerebral, splenic and hepatic, subcutaneous connective tissue, lungs, uterus), and calling special attention to those of Rivolta, who in 1868 observed a case of herptic eruption due to filaria, of Siedamgrotzky who had seen in a dog on the external face of the thighs and of the shoulder, small pustules, where the pus contained small filarias, of Rosso who on the skin of sluts had observed numerous small papules containing worms of their embryos: of Fettich who had found them under the skin of the

forearm of a greyhound, of Schneider who described a case of diffused dermatitis in which also small worms were detected—all of which proved beyond a doubt that cutaneous filariasis does exist; the author concludes his long article by the minute description of four personal observations which come to add to the value of those already on record and confirm several of the facts actually known relating to the disease.

The fact of cutaneous manifestations is a very important one in relation to the therapy of the disease. An early positive diagnosis being of paramount value. Has the disease remained localized to the skin or is it already generalized in the entire circulation, is then of the utmost primary necessity.

* * *

URINARY VESICAL TUBERCULOSIS.—The pathogeny of this affection has already been the object of many researches. It is generally admitted that the vesical lesion is consecutive to a tuberculosis of the kidneys or of the genital organs. Primitive tuberculosis of the bladder is only exceptional, at least clinic and experimentation agree on that point.

Indeed, from the experiments of Hanau, Cayla, Guyon, Roos-
ing, Baumgarten, Hausen, the possibility of grafting the bacilli
of Koch upon a bladder, seat of trauma or affected with reten-
tion has been confirmed and direct inoculation by instillation is
exceptional. Besides these, experimentation has also shown
that the local lesion follows an ascending process, which from
common cystitis may become a caseous abscess of the walls and
it also confirms the frequency of the extension of the lesions to
the genital organs with the rarity of renal ascending lesions.
Human clinics demonstrate also the relative inocuity of vesical
tuberculosis in man, the rarity of its spreading to thoracic or ab-
dominal organs, the slow progress of its evolution and the possi-
bility of its recovery.

Mr. Maurice Breton has reported in the *Annales de Pasteur*
a series of experiments that he has made on quite a large number

of guinea pigs and rabbits to the effect of controlling the general conclusions presented above, and to study how the infection may be realized by the direct entrance of the bacilli into the bladder by the urethra of those animals and also the anatomo-pathological characters of the lesions with the mechanism of the propagation of tuberculosis to other organs close by or far away.

From the description of the experiments made, the conclusions derived from them are as follows:

1. Tuberculosis infection of the healthy and sound bladder by urethral entrance is easily realized in guinea pigs, but more difficult with rabbits.

2. Renal infection is never realized by ascending process. It is generally admitted that it takes place by the blood circulation. But in the cases where the lesions of the genital organs precede those of the kidneys, it is believed that the tuberculous products are taken up by the circulation from the bladder or the prostate and infect the glomerules. The experiments of Breton show on the contrary that in animals, guinea pigs or rabbits, the infection takes place by the lymphatic vessels. The bacilli travel through the thoracic duct and are poured afterwards into the general circulation. They must have passed through the sub-lumbar and mesenteric lymphatic glands to reach the circulatory current. It is then after leaving the lymphatics that the infection becomes hematic.

3. The experiments are thus another evidence that the frequency of tuberculous pulmonary infection is taking place by the lymphatico-hematic circulation.

TOXIC AND MEDICAMENTOUS MILK.—The question of the passage of toxic and medicamentous substances through milk and of their possible injurious effects thereof, has been the object of a series of experiments and observations by Prof. Porcher of the Lyon veterinary school, which he has recorded in and which I extract from the *Presse Medicale*.

Milk in its organoleptic qualities, coloration and especially odor and taste can be modified by the addition in the food of

some plants, which do not enter in the ordinary diet (anise, garlic), etc.

The elimination of mercury through the mammae has been the object of discussion. But for Porcher, mercury is indeed eliminated by the milk. But the quantity eliminated is always very limited and at times very irregular. Relatively large doses of mercury salts are required to have a marked presence of the metal detected in the milk. Other metals, lead, copper, zinc, antimony, bismuth, arsenic, iron have also been found being eliminated through the milk.

The passage of salicylate of soda is not doubtful, but it is very limited and its presence is not injurious to the quality of the milk. With iodine the detection is readily made. Anæsthetics also, ether, chloroform and alcohol are eliminated by that source. But very large doses are comparatively necessary before they are detected. Chloral is likewise. As for antipyrine the proportions of quantity eliminated are very small.

The passage of alkaloids in milk is rather difficult to appreciate as the doses administered must be very large and give general intoxication for their presence to be detected in the milk.

To resume, it may be considered as certain that when the mammae eliminate some toxic or medicamentous substances, which have been administered with a therapeutic or experimental object in view, this elimination is always very limited and the dose, which has been given must have necessarily been considerable to allow the detection in the milk of their presence and yet that will be in very small quantity which will be an *infime* proportion in relation to the dose given.

The udder in normal function is not only a filter and its functions as an emunctory are very small. The mammary cells select from the elements that the blood vessels bring them, those that are indispensable for the elaboration of the elements constituents of the milk.

But if a toxic diet, reduced or temporary, has no great effect upon the quality of the milk, it is not the same when to the factor "nocivity" are added those of "continuity" and

"great quantity" as it is the case with cows fed on industrial remains.

OVARIECTOMY AND TUBERCULOSIS.—To have these two conditions brought together may seem strange in a periodical like the REVIEW and yet perhaps there may be some practical applications derived from their connections in human medicine as I find them related in an extract from the proceedings of the medico-biological society of Milan, referring to a communication made by Doct. F. Mirto. Gynecologists are divided into two camps, on the question of the opportunity of the prevention of pregnancy in tuberculous women. Some advocates of the sterilization of tuberculous women, perform vaginal hysterectomy with removal of the ovaries. After the operation, an improvement is observed in the general condition of the patient, improvement which from want of positive data are interpreted as due to an unknown action analogous to that of single laparotomy in tuberculous peritonitis.

In 1903 Dr. Mirto published a book on "Experimental infection after Ovariectomy," where it is shown that the operation renders the organism more resisting to an infection. From this he has thought that perhaps the improvement in tuberculosis after hysterectomy might depend from the ovariectomy and he then made experimental researches to verify this supposition.

To ten does he injected in the veins of the ear 1 c. c. of an emulsion of tuberculous bovine culture. Five of the does were castrated after fourteen days; they died in average 31 days after the operation. The control animals lived only fourteen days. In a second experiment, with 10 new does, 1 c. c. of emulsion diluted by half was injected and five of these rabbits were castrated 18 days after. The witness animals died in 24 days, and the castrated in 51.

These first experiments have a tendency to show that ovariectomy has a favorable influence on the course of tuberculosis or at least on extending life. Dr. Mirto proposes to make other experiments on a large number of animals and principally to

realize an infection of slower activity which would allow a positive settlement of the question.

BIBLIOGRAPHIC NOTES.—It is a peculiar fact, but very seldom is a new scientific book published, without being offered to its readers with a special call to them. This I have observed with almost every new work, whether of human or veterinary medicine. The call is to students and practitioners. This is very well probably for the former. But is it as well for the latter? Of course, the new book can, and is certainly intended principally for the students as in all probabilities the contents will be of new and great interesting value to them. But unless the publication contains new facts, new theories, new discoveries or any thing similar, which the practitioners may not know or have possibly forgotten then will it not look as if after all the new book can be considered then and only then as written for him as well as for the students. At any rate, it is a fact that new books are generally intended or supposed to be for students and practitioners as well.

Of course the one that I have received from the house Alexander Eger, of Chicago, "A Text Book of Veterinary Pathology," by Prof. A. T. Kinsley, M.Sc., D.V.S., of the Kansas City Veterinary College, is for students and practitioners, so it is stated in the preface.

Veterinary Pathology has a special object in view, "namely to consider and place every phase of pathology from the veterinarian's point of view." No doubt a very good desire. As if it is true that works are many on the same subject in human literature, up to this new issue, none existed in English language *at least*, which was *strictly* covering the same ground and in the same manner that Prof. Kinsley does.

The contents of the book are divided into twelve chapters (1, the Cell; 2, General Consideration of Disease; 3, Immunity; 4, Malformations; 5, Circulatory Disturbances; 6, Inflammation; 7, Progressive Tissue Changes; 8, Retrogressible Tissue Changes; 9, Necrosis and Death; 10, Tumors; 11, Fever; 12, Infective Granulomata, and last but not the least, a valuable

glossary). There are also five inserta; botanical names, bacterias, protozoa, helminthes, arthropods. There are also 205 illustrations, most of which are very good, but unfortunately distributed in a rather peculiar manner here and there through the book and mixed in the reading matter which complicates the reading.

The manner in which the book is presented is a credit to the author and the publisher. Neatly printed, easily read, handsomely bound, but why is the binding made in such a way that the insertia cannot be looked into.

However, "Veterinary Pathology" is one successful effort from which all students, we are sure, will learn much and after all practitioners cannot fail to refresh their mind by reading it. We hope that another early revised and enlarged edition will give a better opportunity to the author to do ampler justice to some of his present chapters which are perhaps too concise in the present issue.

I do not know if I can examine and do justice to the addition that Prof. Cadeac has made recently to his Encyclopedia, by the publication at Bailliere of Vols. 3 and 4 of the second edition of Internal Pathology. The general arrangement followed in the previous issue of that excellent work has been kept and successively the diseased processes as they occur in the various species of domestic animals are considered. Additional new facts are here and there interlaced and parts which were possibly not as complete as they might have been have received the necessary corrections and additions. On that account these two new volumes are considerably enlarged as well as they are revised.

In the third volume is concluded the continuation of the second, viz., the end of the digestive apparatus. A chapter for the pancreas. A very complete treatise on the pathology of the liver and one on the diseases of the peritoneum. The book then begins the consideration of the respiratory apparatus, nasal cavities, sinuses, and larynx. It covers a work of 500 pages with 156 illustrations. The fourth volume embraces the pathology

of the bronchia, lungs and pleura; it is the work which might be said essentially that of the respiratory organs; the subject is treated in over 450 pages and has 86 illustrations.

By the publication of these two volumes of internal pathology, a valuable addition is made to veterinary literature by its author, whose literary energy seems to have no limit.

A. L.

ANTISEPTIC VS. GERMICIDE.

"Since germs have been discovered and determined to be the cause of various morbid conditions many new terms have arisen in the literature of the subject. Some of these have answered for temporary use until more accurate terms were found to take a permanent place in our language.

In accurately differentiating between terms we have yet to become accustomed to the exact meanings of the words antiseptic and germicide. Heretofore they have been used interchangeably as if they were synonymous.

If we are to be more exact in our language in the future we must limit the word germicide to those agents or processes which definitely destroy or kill disease germs. Nothing less than that will comply with the meaning of the term. It is doubtful if we have any agent which is capable of doing this which is safe to use in or on the human body. The two standard agents referred to when this term is used have been carbolic acid and bichloride of mercury; although in the strength in which they are required for this action they are far too poisonous for use.

For example, according to a report of the Council on Pharmacy and Chemistry of the American Medical Association, a 1 to 5,000 solution of bichloride of mercury does not kill the *staphylococcus pyogenes aureus* in five minutes' contact. That is, it is not germicidal in that strength in that length of time; yet it is highly poisonous to the individual if kept in contact with an absorbing surface for that length of time. We have in the past few

months published several articles calling attention to the injurious effects of bichloride when used as a local antiseptic.

The dangerous effects of carbolic acid are so well known that we need hardly refer to it here. The following extracts from Hare's Therapeutics will show how the question is viewed in recent literature:

"A large number of cases are on record in which carbolic acid poisoning ensued from absorption from surgical dressings."

"When iodoform is absorbed by the stomach or skin from surgical dressings, it induces a train of serious and curious symptoms."

"Bichloride of mercury, even in this dilute lotion (1:10,000), has, when used in the peritoneal cavity, given rise to toxic symptoms."

"Koch stated that where albumen was present, bichloride was decomposed and rendered inert."

An agent may be markedly antiseptic, that is, it may inhibit the growth of disease germs, without being specifically germicidal and without being injurious to the human organism. A recent report from the Council on Pharmacy and Chemistry shows us that chinosol is such an agent to a very high degree. According to the report of the Council, chinosol forms no precipitate in any dilution, while carbolic acid forms a slight precipitate in dilutions of 1 to 100 and 1 to 200, and mercuric chloride forms a heavy precipitate in all dilutions up to 1 to 1,000, and a less heavy precipitate in 1 to 5,000. The report of the Council shows that chinosol is an efficient antiseptic and yet is not poisonous. Neither is it irritating or caustic to the skin or mucous membrane. In fact, it is an ideal antiseptic agent.

Years ago we used a solution of chloride of ammonium as a lotion in minor surgery. It was not germicidal, yet it was highly antiseptic and excellent results were obtained with it. However, it was so irritating that we finally quit using it. Let us bear in mind the difference between a germicide and an antiseptic."

The above from *The Medical Council* of November, 1910, is interesting because it stimulates a train of thought along lines

that are not usually clearly outlined. The two terms in question suggest different applications. For example, we think of antiseptis as against or preventing sepsis, and of germicide as killing germs, and yet each of them do exactly the same things, and the definitions of each, in our medical dictionaries arrive at the same ends. *Dorland's Medical Dictionary* defines an antiseptic as 1. "Preventing decay or putrefaction. 2. A substance destructive to poisonous germs"; and gives as some of the chief antiseptics, "alcohol, boric acid, carbolic acid, creosote, corrosive sublimate, common salt, charcoal, chlorin, tannic acid, sugar, and vinegar."

The same authority defines a germicide as "an agent that destroys germs." No examples are cited. Antiseptic is derived from two Greek words meaning *against* putrefaction and Germicide from two Latin roots, *ger'men*, *germ* and *cae'dere to kill*. So that one is against putrefaction, and therefore *destroys* it when it meets it and the other *kills* germs. Obviously their functions and uses are identical, and the same agents may be employed against putrefaction either as an inhibitive or a destructive in varying degrees of strength. *The Medical Council* states that "an agent may be markedly antiseptic, that is it may inhibit the growth of disease germs, without being specifically germicidal" * * * and further on places *chinosol* in that class. In substantiation of our above contention that varying degrees of strength constitute the distinction, we may state that it has been demonstrated clinically that the substance mentioned, chinosol (C_9H_6NO, SO_3KH_2O) oxychinolin potassium sulphonate, is a germicide. We are grateful to the editors of *The Medical Council* for the opportunity of reading their article, which we have reproduced with the hope that it may act as a stimulus to some members of the veterinary profession to discuss the subject through the columns of the REVIEW.

As we are closing our forms we learn with much regret of the death of Dr. W. H. Gilbert, of Leesburg, Ohio. The doctor had been a constant reader of the REVIEW for upward of twenty years.

ORIGINAL ARTICLES.

ANENT THE PROPOSED "UNIFORMITY OF DEGREES FOR VETERINARY COLLEGES."

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I. INTRODUCTION.

1. Dr. Liautard and Dr. Glover on Veterinary Degrees.

By a happy coincidence, in the February, 1911, number of THE AMERICAN VETERINARY REVIEW, there occurred the publication of two articles, nay three, all referring to uniformity of degrees for veterinary colleges. Dr. Liautard, though strange to say with little of his usual Gallic bitumen, reports (p. 589) that, by the decree of Kaiser Wilhelm, "the Prussian veterinary schools of Berlin and Hanover will now confer the degree of Doctor Medicinæ Veterinariæ*" on those who successfully complete the course. Dr. G. H. Glover, of Fort Collins, Colo., also, has in the same number an article on "Uniformity in Degrees and Matriculation Requirements for Veterinary Colleges" (pp. 634-641), and, in his open letter to members of The American Veterinary Medical Association (p. 686) says: "In the matter of uniformity of degrees, it is absurd having so many degrees all meaning the same thing. Let us resolve to be magnanimous in this matter and say that we will make the change if the majority vote for some other degree. The cost would be only nominal; the price of a new stone for printing diplomas in some cases. The objections, with selfishness eliminated, are not serious."

* In the REVIEW the word is erroneously printed veteranariae.

In this communication I propose to make some remarks which seem to me apropos, anent the statements of both of these gentlemen.

II. VETERINARY DEGREES TO BE CONFERRED IN GERMANY AND THE PROBABLE EFFECTS IN EUROPE.

1. *The Decree of the King of Prussia Granting the Right to Confer Veterinary Degrees.*

As write I have before me the October, 1910, number of the *Zeitschrift für Fleisch und Milchhygiene*, the great journal published by Robert Ostertag in Berlin. On page 28 of the issue there appears in the *Tagesgeschichte*, or news of the day column, an important notice, printed wholly in italics for the sake of emphasis, that, at last, the title Doctor of Veterinary Medicine is to be conferred on graduates in Prussia. The Emperor of Germany, who is also king of Prussia, has promulgated by royal decree the notice that hereafter the Tierärzliche Hochschule (Veterinary High Schools), corresponding to our veterinary colleges, in Prussia, shall have the right to confer, under certain restrictions, the title of Doctor of Veterinary Medicine upon their graduates. The institutions referred to are the Veterinary High Schools of Berlin and Hanover, the leading veterinary institutions in Germany, which were established more particularly to train veterinarians for the German army, and the graduates of which, who happen to be Germans, must, on the completion of their course, serve as army veterinarians for a period of years. Hitherto the title of "Doctor" has never, as far as I can discover,, been conferred by institutions of veterinary science in Germany.* Nor is this particular title, that of Doctor of Veterinary Medicine, as far as I know, conferred to this day in any

* Dr. S. E. Bennett, Inspector in Charge, Bureau of Animal Industry, U. S. Department of Agriculture, Chicago, informs me that, when he was a student at Hanover Veterinary High School in Prussia, he knew of instances where men had veterinary degrees, which he believed were conferred in Germany. My opinion is, however, that he is mistaken. In my reading of German papers and books I do not recall ever seeing a name with the abbreviation, signifying a veterinary degree, printed after it. (D. A. H.)

other country of Europe. Before the present imperial German decree the only title permissible, for those who passed all the examinations of the course, was that of "approved veterinarian"; now the title is to be Doctor Medicinæ Veterinariæ, that is Doctor of Veterinary Medicine, which is abbreviated in the German press Dr. Med. Vet., and this is the abbreviation given to the title in the *Zeitschrift* we are quoting.

2. *Veterinary Doctorates Not Hitherto Conferred in Europe.*

In this connection it is worth remembering that not one of the great teachers of veterinary science in Germany to-day has the title Dr. Med. Vet. They are all M.D.'s or Ph.D.'s., and usually they are the possessors of both titles (which is an excellent commentary on what the Germans, by implication, seem to think is a necessary preparation for the best work in veterinary medicine). Drs. Ostertag, Schutz, Schmalz, Koch, Friedberger, Frohner, for instance, all had the title M.D. This fact is not, perhaps, generally known in America. Nor in France to this day is there such a thing as "graduation," the conferring of a degree, in veterinary medicine. About a year and a half ago the French Minister of Agriculture was besought to rule on the matter and to promulgate such a decree in France as Emperor William has done in Germany in his capacity as King of Prussia, permitting the National Veterinary Schools of Alfort, Lyons and Toulouse to confer the title of "Doctor." However he has not yet done so. The other Teutonic states and other Teutonic countries will probably follow the lead of Prussia, so that North Eastern Europe will soon be swarming with Doctors of Veterinary Medicine. Moreover, in Great Britain and Ireland, except the rather uninviting and opaque degree of Doctor of Hygiene, conferred by the University of Liverpool, which has not turned out, perhaps, to be so delectable as was thought when the institution first concluded to confer it, there is no such thing as a title of "Doctor" conferred on veterinarians. Hence in the veterinary and general press the persons who have completed the course in

veterinary science in the colleges, and are practicing, are never referred to as Doctor So-and-So, but Mr. So-and-So. Though, despite British conservatism and insularity, I have no doubt that, in time, even there the title of "Doctor" will be conferred on those who complete a veterinary course. It will be interesting to observe how British veterinarians will take the news from Prussia relative to the degree Dr. Med. Vet.

3. *Dr. Liautard's Inaccuracy in the AMERICAN VETERINARY REVIEW.*

Dr. Liautard informs us, in his recent communication, that, "in abbreviation the title (Doctor Medicinæ Veterinariæ) will correspond to the D.V.M. of some of our American schools." Perhaps so! Yet that is not the way the Germans themselves abbreviate the title; nor is it the way the article in the *Zeitschrift* puts the title. The article is headed in bold, black type, "Dr. Med. Vet. in Preussen." Dr. Liautard is a staunch believer in uniformity of entrance requirements for veterinary colleges, uniformity of curricula and uniformity of degree. My impression is, from at least two articles he has written on the subject which come to memory, that he favors the conferring of the title Doctor of Veterinary Medicine on the completion of the veterinary curriculum, which, apparently, he would abbreviate D.V.M. It is however, questionable whether the Germans will so abbreviate the title created for them by the imperial decree, and whether they will place the letters according to that arrangement (D.V.M.). And this leads me into the general discussion.

III. THE DIFFICULTIES WHICH WILL BE ENCOUNTERED IN AN ATTEMPTED REFORM OF VETERINARY DEGREES IN AMERICA.

1. *The Genesis of Veterinary Degrees in Germany.*

Dr. Glover champions the uniformity of degrees for veterinary colleges and is of the opinion that objections to his scheme, with selfishness eliminated, are not serious. In Germany it will

be a comparatively simple thing to bring into being a uniform degree and a uniform putting in abbreviation of that degree when it is placed after names of possessors in writing or in print. The word of the King of Prussia creates the title for Prussia, and, because he is also Emperor of Germany, by custom his desires will be followed in all veterinary schools throughout the empire. Denmark, Sweden, Norway, Austria will follow suit. France, not to be outrivaled, will adopt the same degree. The British, not to be outdone, will eventually also adopt the same plan or a similar one. It is easy to see that there will be uniformity of degree and uniform abbreviation of it and arrangement of letters in European countries. Its genesis is simple—the decree of an emperor; its uniform method of abbreviation easy—custom based upon the original decree of a potentate.

2. The Conferring of Veterinary Degrees in America.

But the genesis of veterinary degrees or titles in America is far different. Here we have conferred titles galore on those who have successfully finished veterinary courses. It is now Germany's turn; though she will stick to a single title—the Germans will not have kaleidoscopic veterinary titles. To me the most amusing thing in our profession to-day is the titles with which we are loaded, and the barnacle-like tenacity with which we cling to a particular arrangement of letters, for their abbreviation, which college or university has given us the right to place after our names. Dr. Glover will find, if he has not already done so, that, instead of entering upon an easy undertaking to bring about the reform from variegation to simplicity of veterinary title, he is shouldering a very difficult task. What is the sum total of men now living who have graduated at American veterinary colleges since they began to confer degrees some forty or fifty years ago? Nobody knows; perhaps nobody will ever know. Just what are the titles which have been conferred? Place the titles and figures in columns! Look at them! What

material for the satirist! What a choice subject for a lampoon! Every American, from your tonsorial artist to your portly preacher who had just donned his D. D., dearly loves a title; just as every Englishman, it is said, dearly loves a lord. Thousands of veterinary "graduates"; a score of titles! Several generations of men must pass away before all these high-sounding titles, these assemblages of capital letters, affixed to names, will, should the proposed reform ripen, have disappeared.

IV. THE THREE ASPECTS OF THE QUESTION OF UNIFORMITY OF AMERICAN VETERINARY DEGREES.

The question of the uniformity of degrees for American veterinary colleges has three aspects: first, the historical aspect; second, the present-day aspect; third, its future aspect should uniformity of title be established.

1. *The Historical Aspect of the Problem of Uniformity of American Veterinary Degrees.*

The Use and Abuse of the Doctorate.

The multitude of designations, the chaotic condition of affairs with regard to degrees, the ludicrous situation—enjoyable material as it would be to a cartoonist who would make merry over us and afford much amusement to the public if he should make use of it—we have brought upon ourselves. We, who wish nothing more than to have our profession taken seriously, have left all doors open for an attack upon us. We think, perhaps, we are not thin-skinned; but, should our vulnerability be tried by the cartoonist who seizes upon the opportunity we have left him to sketch us as we are, we would prove not to be so impervious as the rhinoceros. The history of American veterinary titles is not difficult. In its historical aspect the problem is not hard to understand. The colleges, from the earliest days, knew that those who finished the course must be dubbed "Doctor."

This is the accepted appellation for anyone who completes any course with the word medicine found in it, and whatever is its application in practice. Besides the word "Doctor" preceding the man's name, or called out in his hearing, immediately appeals to the American and sets him up by the ears. As a matter of fact, though, on this side the Atlantic our people, who relish contradictions, have cheapened the title "Doctor" by the promiscuity with which they have used it—they are pleased with the sound of it, but they tinge it with vulgarity in its usage. Here in Chicago we have men who go from house to house destroying vermin who call themselves "roach-doctors"; we also have doctor-chiropodists who "doctor" our toes. I am afraid we of the veterinary profession in America are, or have been, guilty of the same sort of vulgarity. We have not taken the dignified title of "Doctor" with sufficient seriousness and this has damaged us in the public mind.

The Rivalry of the Colleges and Veterinary Degrees.

Nor is this all there is to the historical aspect of reform. A review of the history of the giving of veterinary titles in America shows that the variety of the titles conferred was due, in many instances, to the rivalry of the colleges. Competition is an excellent thing in trade; but, carried too far, it brings harm to educational institutions that are willing to go to any lengths to outdo each other. From the beginning of veterinary education in this country this rivalry has existed, and it has, sad to relate, intensified and become, I fear, more vulgar as time has gone on—or at least it has, in many degrees and shades, cheapened the profession, and had the flaw of vulgarization in this matter of variegation of veterinary titles. Is there any other explanation for the existence of them? There is none. The lame excuse can hardly be offered that they are due to the fact that the officials of the different colleges did not meet for agreement on policies. The consequence is that an evil has been done which cannot be effaced in our own or the next generation. Thousands of titles

have been given which cannot now be expunged—only the agonizingly slow processes of time can wear away the large, funny titles from sign boards and door fronts, until the hour shall finally come when we shall see them no more on letter heads nor in the newspapers.

2. *The Present-Day Aspect of the Problem of Uniformity of Veterinary Degrees.*

The Uniformity of Degrees Granted in Other Professions.

What is the present-day aspect of this question of the uniformity of degrees for veterinary colleges? We find ourselves open to contempt and are making ourselves and our work ridiculous—stuff out of which lampoonists may make capital. What is more, we are doing it in face of the uniformity of degrees given to graduates in the other professions. An M.D. is an M.D. the world over, whether the degree is won at Buda-Pesth, Edinburgh, New York, or anywhere you please. What means this foolish talk that the words embraced in a title signifying the veterinary degree should direct public gaze to the surgical side of the work? Have the eminent surgeons in the human medical profession, like Senn, Murphy, Stimson, gone about lusting for so strange a title as S.D., signifying Doctor of Surgery, or are they not satisfied with M.D.? Neither do they think they are lessened in the esteem of the public as surgeons by signing themselves M.D. Does not custom and the law require them to sign themselves by the time-honored signification of graduation the uniform abbreviation of title, M.D.?

Uniformity in Abbreviation of Veterinary Titles Necessary.

The present-day aspect of the case is not improved by the fact that the problem is not only one of the advisability of adopting a uniform degree for veterinary colleges, but the desirability of arriving at a conclusion how the letters signifying the title shall be placed after the name of the possessor of the title. Dr.

Liautard seems to conclude that the title Doctor of Veterinary Medicie should be abbreviated and written D.V.M. Dr. Glover, if he has not lost sight of the fact, which is unlikely, at least does not make enough of the fact that if the title Doctor of Veterinary Medicine becomes acceptable, by kind persuasion, or by "elimination of selfishness," to all, we have still the question how shall the letters signifying the proper abbreviation be placed. Cornell, Ohio State and Ames men sign themselves D.V.M. Pennsylvania men tenaciously hold to V.M.D. Harvard and McKillip men will have it that the letters should be M.D.V. There are reasons for all this. Can there be uniformity; can agreement be reached? We must do so. There is no alternative. What we want is the attention of the public directed towards us and fastened upon us. We must, it is inexorably necessary, reach an agreement on a uniform title and uniform manner of putting the title in order that the public may become rapidly trained to accept the one title as the sign of the profession, just as the title M.D. signifies that the holder is a member of the medical profession. Commercially it is sheer waste, this disparity in degrees. In uniformity there is strength; in dissimilarity there can be nothing but friction.

3. The Future Aspect of the Question of Uniformity of Veterinary Degrees.

Should uniformity of degree be adopted the change will bring another aspect to the problem in the future. When men from each college have the same abbreviated title this will not eliminate the rivalry between the colleges, or rather I should say that emulation which adds keenness to the scientific work done in them, and is the very salt of progress. The man from Pennsylvania may say I am a D.V.M.; the man from Kansas City or San Francisco, or where you will, can say the same thing, should, for example, the title and abbreviation become universally acceptable. The same is true whatever title be chosen. Nor would I have other than rivalry between the colleges. When any insti-

tution settles down to smug contentment with itself, or reaches the baneful conclusion that it is beyond a doubt superior to all others and outshines all, it is in the position of the man, mentioned by King Solomon the Wise, whose pride came before his destruction and whose haughty spirit came before his fall. In case it seems desirable to a man to point out where he graduated, when he writes out his title, he will, if he follows the universal custom, parenthesize his college, thus: John Smith, D.V.M. (Ohio State). This is a form used the world over. Men in England always say _____, M.D. (Oxon.) or M.D. (Edin.). Men in Germany say Ph.D. (Berlin), or Ph.D. (Göttingen). In the United States, more and more, following the European custom we are writing _____, M.D. (Yale) or _____, M.D. (Harvard). There cannot, therefore, be any argument brought against the plea for uniformity of degree on the score that it is colorless, that the one title does not point out where a man was trained.

V. CONCLUSIONS OF THE PRESENT WRITER.

1. *The Times and the Customs of Our Day Require That a Uniform Degree be Conferred.*

We must be malleable and ductile to the conditions of the times in which we live. We must obey the prevailing sentiment of the countries in which we live and the people whom we serve. O, tempora; O, mores! said the great Roman in one of the Cicero-nian orations. O, times; O, customs. We are the servants of the times and customs and must give heed to their dictation.

2. *The Futility of Titles.*

At bottom what boots it whether we have a degree or not before we enter upon the practice of our profession. The great English painter of pictures of the heavens and the seas—Turner, to whose works a whole room is devoted in the British National Gallery—was once asked by a man, who was looking over his

shoulder as he worked at the easel, how he mixed his paints to bring about his multitude of hues and shades. "With brains, sir," was the quiet reply. It matters not in reality whether a man has a veterinary degree or not; nor how he signs himself, whatever twist he gives to the letters signifying his degree, so long as he has veterinary knowledge and can apply it usefully. Were it not that the times and customs demand a title and a uniform putting of it, I would not be able to find any sufficient reason for having a title at all. Degrees do not make men. They are useless verbiage if the man possessing them is of no account; and the man who is of account hardly needs them. There are instances in our day of men standing high in their profession; yea, more, counted great educators in their professions, and holding university posts, who never possessed a title Judge Cooley, the celebrated Dean of the University of Michigan Law School, the authority on American Constitutional Law, never so much as had a baccalaureate degree in law conferred on him. Cuthbert Pound, now Associate Justice for life of the Supreme Court of the State of New York, was for years a Professor of Law at Cornell University, though he held no law degree. In our own profession Professor Walter L. Williams goes degreeless—he feels that he cannot conscientiously so much as write himself V.S. Though, whatever be his faults, who can deny that he has done the profession much service. Yet he, I think, would be the last one to deny, that, if a man has successfully passed a veterinary course in a reputable veterinary college, the times demand that he must be given a degree, in acknowledgment of his completion of the curriculum.

3. Uniformity of Degree as a Public Question.

Beyond a doubt a degree should be conferred. Beyond a doubt, also, the title given by any or all should be uniform. The times demand it and our increasing importance in the public eye requires that we bow to customs set in the other professions, more particularly in the medical professions, and expected of us.

If we are wise we will pay attention to the ways of the world and bring about the reform now being agitated. Uniformity of degree from veterinary colleges; uniform abbreviation of the words of the degree; uniform placing of the letters signifying the abbreviation of the degree—this reform would be of little cost if it could be brought about. If it cannot, we must hope for nothing but trituration at the hands of some mocking satirist who will seize upon this topic and grind us to powder. Public esteem is everything in the success of a learned profession. That profession which does not take it into account is blind to the necessity for public favor. We cannot live without public favor; we must subordinate ourselves to its demands.

THE many friends of Dr. J. Arthur Goodwin, of New Iberia, La., will be pleased to learn that he has completely recovered from his recent illness.

Two noted worthies were discussing a mooted point in grammar as to whether a hen sits or sets when she takes to her nest. "Seems to me it's a heap more important," interrupted a by-standing rancher, "whether she lays or lies when she cackles."—*Horn and Hoof.*

DR. RUTHERFORD AGAIN HONORED.—Dr. D. A. de Jong, General Secretary of the Commission of the International Veterinary Congress, has recently advised our esteemed confrère, Dr. John G. Rutherford, that he had been appointed as member for Canada on the Permanent Commission. Dr. Rutherford, who never fails where duty calls, has signified his acceptance of the appointment. If our conception of the conditions is correct, the membership is limited to twenty-five veterinarians selected from the various countries of the world; which makes the appointment of Dr. Rutherford a distinction of which the entire profession are justly proud. Canada may be doubly proud, since in selecting her Veterinary Director General as one of its members, Canada has been favored for the first time with appointment to this commission. A meeting of the Commission has been called at Baden-Baden, early in June to commence preparations for the next International Veterinary Congress in London in 1914.

BOVINE TUBERCULOSIS AS A PUBLIC WELFARE PROBLEM.*

By M. H. REYNOLDS, ST. PAUL, MINN.

In this study I wish to present first of all the veterinary profession as a public welfare consideration. It is self evident that the veterinary profession must play an important part in any solution of the bovine tuberculosis problem. Everyone who has given any thought to public questions knows well that prosperous agriculture underlies national prosperity. A nation may prosper after her mines have been exhausted, but not after her soil has been exhausted; not after her agriculture has failed. Prosperous agriculture underlies permanent national prosperity and it is just as plain that animal husbandry underlies permanently successful agriculture in this country. Not long since I heard a prominent merchant, a jobber, say in public that they always felt safe in extending large credit and in carrying large risks in farming sections where diversified farming was followed and where the farms were well stocked with domestic animals. When, therefore, the veterinary profession is protecting our animal husbandry, that profession is protecting to a very important extent the entire commerce and prosperity of the nation as well as the wholesomeness of her food supply. The principle is coming into rapid recognition that veterinary education and competent veterinary service are matters of public concern for which the state is justified in appropriating public funds. This is clearly suggested in the movements by so many states establishing state veterinary colleges. This is notably true of Alabama, Colorado, Iowa, Kansas, Michigan, New York, North Dakota, Ohio, Pennsylvania, Washington, with other states already planning to fall

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into line. If veterinary education and competent veterinary service for live stock interests were not matters of public concern, then there can be no justification for the appropriations of state funds to such ends.

Bovine Tuberculosis as a Public Welfare Problem.—I wish that we veterinarians of Minnesota, and far beyond I wish that we veterinarians of the United States and Canada could do something very effective toward getting the public to realize the magnitude and the difficulty and the importance of tuberculosis among domestic animals.

Everyone who has thought carefully and seriously on this question knows that the problem is tremendously important, that it is important on the score of public health and that it is important on account of the enormous financial interests involved and threatened.

The relation of bovine tuberculosis to human health as a sanitary problem belongs to another address planned, I believe, for this program, and for my part it may suffice to say as pointedly as possible that a great deal of discussion on this question makes me tired. Surely we can sum up the whole situation by saying that scientists who have been studying this problem are clearly divided into two groups: those who believe that bovine tuberculosis and human tuberculosis should be distinguished as due to two essentially different organisms. The other party of scientific men insist that the human tubercle bacilli and the bovine tubercle bacilli are merely variations of the same organism and show no more variations than may be accounted for by difference in environment; but both of these parties of scientific men concede that man is susceptible to the organism if there be but one or to both organisms if there be two; and it seems to me that we need not concern ourselves seriously as practical sanitarians with an academic question.

As an eminent authority has shrewdly observed, either there must be but one organism to which man and cow are both susceptible, or there must be two organisms and the so-called bovine tubercle bacilli which have been recovered from disease lesions

human tissue have been of bovine origin and therefore man must be susceptible to both organisms.

We can get what is probably a fairly good estimate of what bovine tuberculosis costs the United States in direct financial loss from an official statement by Dr. Melvin, Chief of the Bureau of Animal Industry that tuberculosis among farm animals costs the United States annually more than \$23,000,000.00. This estimate is apparently based chiefly upon items which relate to dairy industry and does not make an attempt to give a careful estimate as to the losses to the cattle breeding interests in the form of actual loss of valuable breeding cattle sold at beef prices or for slaughter, nor does it include loss in the form of disturbed plans of our breeders, nor losses in the form of injury and ruined reputations for herds, nor the check which it must put upon the pure bred cattle business.

There are enormous losses from carcasses condemned on account of tuberculosis at our great packing houses—carcasses of both cattle and hogs. Condemnation of such carcasses has become a consideration of such great importance that packers are seriously considering the question as to what can be done about it. Some of them, notably Swift and Company are ready to spend money to help study the problem. During the present year an International Commission of veterinarians, breeders, packers, bacteriologists and government officials has been holding sessions about every three months studying this great problem of bovine tuberculosis control in an effort to formulate well considered and workable plans for states and governments to adopt in their future control work with the disease.

I was so fortunate as to have the privilege of sitting as a member of this commission, and although I have been deeply interested in this question for several years studying every phase of it to which I had access, I confess freely that service on this Commission with these great problems directly in front of us for solution brought a new realization of the magnitude and difficulties of the problem. This commission will make its first report to the American Veterinary Medical Association at San

Francisco in September and it may be confidently expected that a useful service has been rendered toward the control of bovine tuberculosis.

Historical Study.—One who is interested in this problem gets most interesting information from a study of the history of tuberculosis control work that has been attempted by various states of the Union and some European countries. So far as the United States is concerned there has been at the beginning in each of the states a rather amateurish and premature attempt at eradication usually with unsatisfactory and harmful results, or at least results that were for the time being harmful. In many cases there have been irregular testing of herds here and there just to see what might be found. Some owners have really wished to know whether their cattle were sound and others wished to really try the tuberculin test. Such work has been scattered and fragmentary and has accomplished very little except public education. After a considerable period of this kind of work in each state there has followed better organization of individual state work and then usually inspection ordinances providing for tuberculin test of city dairy herds. After these ordinances were adopted and the authorities attempted to put them into force, then there has always followed a period of frantic opposition by dairymen and dealers who predicted dire results that were sure to befall the dairy interests. In most cases these ordinances have led a very uncertain existence with their periods of attempted enforcement alternating with periods of practical neglect. However, this has all served to interest and educate and the people gradually realized in each of these cities that tubercular cattle were something real, that the tuberculin test was here to stay and that milk from tubercular cows was probably not good material upon which to rear their children. The work of scattered testing continued and investigation at any time would have shown that but a very small percentage of the entire cattle in any large section of the state have been tested. Please let me make it plain that I am not speaking of Minnesota experience, but of states in general that have attempted to do this

work. What has happened in one state has happened in another and their history has been very uniform. In the course of time purchasers of pure bred cattle have begun to inquire as to whether the herd in general is free from tuberculosis; just as the city milk consumer has become sufficiently interested to inquire as to whether the dairy from which he is buying milk has been recently and competently tested; whether the dairy methods are clean, and the milk decently handled. About this time the State Dairy Association and Breeders' Association began to pass resolutions calling for the testing of pure bred cattle sold. A few breeders are advertising herds guaranteed free from tuberculosis, every animal sold subject to test.

In point of historical progress that is about the point that we have reached. Minnesota has probably done as much effective work as any other state in the Union, but our work like others, is open to the general criticism of lacking permanence and incompleteness. We are using a great deal of tuberculin and doing a relatively large amount of tuberculosis work, but we are not as yet doing permanent eradication work, and may as well face the issue squarely on the basis of truth. I do not know that any state in the Union or any nation in the world is as yet doing any permanent control work. Dr. Bang's work in Denmark answers as nearly as any other to the requirements of permanence, but actual eradication accomplished in Denmark appears on cold analysis to be slight.

With this study of historical development in several states in the Union I feel like saying that "here we are and what next." I believe that there will come soon a time when public sentiment will support thorough and careful work and when sufficient funds may become available to do large work and that we are justified at this stage in asking what next—justified in recognizing that the preliminary ground has been broken and that the necessary preliminary experience has been had for really good work. I presume that others who have been in this work for several years feel just as I do that we have been traveling through an uncharted wilderness, or perhaps for a true figure I might say we feel that

we have been wading through an unknown slough for fifteen years or more. But in the course of our wading we have found some spots of firm ground. There have been developed certain general principles upon which we may base future work to illustrate what I mean. It is evident now that comprehensive plans for dealing with tuberculosis must rest upon some very accurate diagnosis, presumably the tuberculin test. It is well settled that tuberculosis is not a disease of breed or type, and we know quite well the conditions under which it is disseminated. We know very well that one tuberculin test of an infected herd and one disinfection is not eradication, but only a first step. It is equally clear that we must have a hearty co-operation of owners and the support of public opinion. We know that any radical legislation which proposes to control tuberculosis and which must operate in opposition to general public sentiment is already defeated. Those who really see the problem know thoroughly well that tuberculosis can never be gotten rid of by any process of rapid eradication, for the expense of rapid eradication and the disturbance of animal husbandry and food production which would result stamps such a plan as necessarily hopeless.

We are about ready for a well defined policy for tuberculosis control work on a large scale, something which no state of the Union nor any nation so far as the writer is able to learn has ever had. Two things must go together in this connection: competent organization and a feasible policy with organization as the first essential. If some body of men were able to sit down and formulate a well considered and entirely feasible plan for dealing with tuberculosis and then would lay such a plan before a state which does not have a competent live stock sanitary organization it would to my mind be exactly on a par so far as results are concerned with the offering of bread to a starving man without hands or other means of getting the bread to his mouth. The situation in our country in respect to state organization leaves very much to be desired. In plain English the situation is extremely unsatisfactory—it's bad. A few states of the Union have really good live stock sanitary police organization,

but these states are only few in number and widely scattered. Some states have practically no organization for sanitary control work and a great many of our states have very weak and inefficient political organizations that are hopelessly incapable of doing anything with such a problem as tuberculosis control or hog cholera eradication or glanders eradication. To my mind the work that most of these states have been doing with tuberculosis and glanders has amounted to about as much in a useful way as a boys' game of hide and seek. Perhaps some of our state authorities have been in fact playing hide and seek with owners and cattle in their tuberculosis work.

Difficulties.—There are a great many difficulties in the way of tuberculosis control work which the public in general and especially our profession ought to see clearly. Difficulty number one lies in the direction of public interest and public education or rather in a serious lack of public interest and public education. Good sanitary control work must always be done somewhat in advance of public sentiment and education, but on the other hand it inevitably fails and falls when attempted on lines too far in advance of such public support. In this work of interesting and informing the public concerning bovine tuberculosis we must utilize every possible effective resource. The agricultural press must be used to the limit. Agricultural colleges and secondary agricultural schools, farmers' institutes, and farmers' clubs, all kinds of veterinary associations, demonstrations at public fair and gatherings, all these and more should be utilized vigorously and persistently if we would secure the public interest and support that is absolutely necessary. There is a serious responsibility upon the veterinary profession in this connection. The practicing veterinarian has great opportunities to serve as an educator concerning tuberculosis among domestic animals.

The great difficulty No. 2 lies in the very magnitude of the problem. It is all right to talk glibly about tuberculosis eradication if you are only joking; but the problem is one of appalling magnitude and difficulty to veterinarians who are in a position to see it. In a case like this it is oftentimes a good thing to stop and

take stock and to see where we are at. There are probably about 2,500,000 cattle in the state and it makes no practical difference in this connection whether there are 2,000,000 or 3,000,000, for when two things are both impossible of attainment with present facilities it makes very little difference that one is relatively larger than the other. Practically they are both of the same size. The number of graduate veterinarians now in the state or liable to be here during the next twenty-five years form a ratio with the total number of cattle now or twenty-five years from now that is quite disappointing when one sees it for the first time. The number of veterinarians now in Minnesota or liable to be in Minnesota in twenty-five years from now is simply insignificant as compared with the total number of cattle, the number of herds, and the number of stables. Our whole number of graduates is about 130, and we have about 20,000 cattle for each man. If our 130 graduate veterinarians were to give their whole time exclusively to tuberculin test work and could average three lots of twenty-five each per week in all sections of the state, we could all of us test about one-fifth of the cattle in a solid year—five years to test Minnesota cattle once. Then there are 323 barns in the state for every trained veterinarian, or nearly one barn for every day of the year. Perhaps this illustration may serve to give some appreciation of the problem for the one state of Minnesota.

This brings us face to face with another difficulty. If there are not enough veterinarians in the state who can take care of their other necessary work and then devote enough time to tuberculosis work to make an appreciable showing, the question stares us frankly in the face, "then who is to do the testing?" "How, and when, and where are they to be trained?" It is self evident to any thinking man that there must come something different from the present situation. There are many other complications and difficulties which could properly be discussed in this connection under the heading of magnitude, but I am really making a serious effort to write a short paper this time. For illustration of what I mean by these other complications, let

me call attention to the fact that valuable herds showing a very large percentage of tuberculosis can not be wisely recognized and dealt with in the same way as herds showing very low percentages of tuberculosis. Herds of great value can not be managed and dealt with by the same rules and methods as common cattle.

There is a very great and common difficulty in the shape of dull moral sense, which people are prone to show when dealing with state regulations and with public funds. The tuberculin test can be tricked and so many breeders and dairymen are doing this that it has become a serious complication.

One of the very greatest difficulties is the one I have already referred to as the lack of efficient, well organized, permanent state organization supplied with large funds and with security of permanence in their plan.

I am ready to grant freely that all these difficulties exist and to concede frankly that they are very great difficulties, but on the other hand, I am confident that we may consider this problem hopefully, not as hopeless but as decidedly hopeful.

Conceding all these difficulties and embarrassments, is it not up to the veterinary profession to do very much more than it has done thus far toward correcting the difficulties and removing the embarrassments.

It need not be argued at this time as to whether vigorous control work on a large scale must be undertaken by the state alone or whether the individual states must surrender their police powers to the government in this respect and the work be done by one powerful sanitary authority. It is very evident that abrogation of police powers of the state involves difficult legal complications and it is just as evident that very many states will not for some years to come voluntarily surrender to the general government their police powers of sanitary control work. For many years to come the individual states must do their own internal work with tuberculosis, the federal government having to do mainly with interstate traffic and interstate phases of the problem.

It is evident already that I will not be able to realize my ambition of writing a really short paper and present what I had in mind to say concerning the question of an ideal state organization for live stock sanitary control work, but I may at least give you the conclusion of it, namely, that there are surely rough waters ahead for future state boards, or state organizations whatever that may be, that attempt to do tuberculosis control work in earnest, *i. e.*, work which is really efficient and permanent and which tends to actually eradicate the disease. Such a board must expect virulent political antagonism, must expect antagonism from prominent breeders and even breeders' associations, and must expect difficulties with legislatures, especially when dealing with the finance committee.

In order that ships may not founder in time of storm, they must have great ballast and great floating power and be capable of skillful guidance. I mean by this that our state organizations which are to do effective tuberculosis control work must have all possible backing and foundation and assurance of permanence. Such an organization should have the direct backing and possibly even close organization with state agricultural societies and live stock breeders' associations, agricultural college or experiment station, and state veterinary associations; it must be able to rely upon this backing—this ballast in time of the storm. We had experience in the last legislature which may help some of us to appreciate just what this means. So far our states have only been playing hide and seek with tuberculosis eradication, and considerable antagonism has already been encountered.

In conclusion may I not call attention again to the fact as I believe it, that only very long time plans are worthy of serious consideration in connection with bovine tuberculosis control work; that rapid eradication is hopelessly impossible; that our state live stock sanitary boards can never employ enough field veterinarians to do tuberculosis eradication work; that if every veterinarian in the state could give his whole time to the work, they would still make but little progress toward actual eradication of tuberculosis from our 2,500,000 cattle and 42,000 stables

which we must consider as all infected until we find out otherwise by actual test, and that state remuneration to owners must be regarded as useful, but temporary policy which must be discarded as soon as public sentiment is ready.

Let me call attention in closing to the absolute necessity of large funds and as justification for large funds let us bear in mind that prosperous agriculture is absolutely necessary to permanent national prosperity, and that prosperous animal husbandry is absolutely essential to a permanent and prosperous agriculture. We have no right to be bashful when talking of financial matters in connection with this work. Any work which will control and gradually eradicate tuberculosis must cost a very great deal of money. That is to be taken as a matter of course for permanent work on large scale.

THE West Virginia Veterinary Medical Association at its fifth annual meeting in Clarksburg January 17th framed a bill regulating veterinary practise in that state.

THE annual meeting of the Pennsylvania State Veterinary Medical Association is at hand. Those that have attended meetings of that model state organization know what awaits them in Philadelphia on the 7th and 8th. All who can possibly reach there from without as well as from within the state should do so.

SECRETARY MARSHALL of the A. V. M. A. states in a recent communication that in working up a program for the coming meeting, new tactics have been adopted, which he believes will work out satisfactorily. The plan is as follows: There are to be eight divisions: Pharmacy and Materia Medica, in charge of Dr. E. L. Quitman; Surgery, Dr. L. A. Merillat; Practice, Dr. S. Stewart; Pathology, Dr. J. R. Mohler; Bacteriology, Dr. Veranus A. Moore; Meat and Milk Inspection, Dr. L. A. Klein; Veterinary Sanitary Police Measures, Dr. J. G. Rutherford. Each of these men is to select papers, discussions, etc., and to take entire charge of all the material that will be presented at the meeting next August. It is recommended that the men in charge of each division read the papers before they are presented at the annual meeting, so that good material will be assured.

RETROSPECTION AND PROSPECTION OF THE VETERINARY PROFESSION IN MAINE.*

By H. L. STEVENS, D.V.S., ROCKLAND, ME.

When I was reminded that I was expected to present a paper at this meeting, I was at a loss to know what to select for a subject, even after I had thought of some things I wished to say, I still wanted an appropriate title. Finally I decided upon "Retrospection and Prospection of the Veterinary Profession in the State of Maine, or Some Things the Profession Has Accomplished, and Some Needs of the Profession and to What Extent Do These Needs Coincide With Those of the Public?"

I shall not pretend to cover the subject in detail. Indeed it is too broad a subject to be exhausted in the brief time allotted to a paper on an occasion like this, even if the writer were capable of doing so.

In the first place we need to remember that no sect or class of men can succeed or prosper to any considerable extent unless they have proper respect for one another, and work together harmoniously; and since we are dependent upon the public for our livelihood, it is especially important that we individually and as a profession merit and receive the confidence, respect and support of the public.

Not so very many years ago our work was done by the farmer, the blacksmith or the stableman, and whenever a man claimed to make his living by being a horse or cow doctor exclusively, or in other words, the professional, in those days, it was often the case that such a person was as low a specimen of humanity as walked upon two legs. He could often neither read nor write.

The old casting rope, without so much as leather straps for

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the pasterns, the pocket jack-knife, the searing iron, and the long necker constituted the old timer's armamentarium. I well remember the first colt I ever saw castrated. It was when I was a small boy. It was done by a person of more than ordinary importance. He was a farmer residing at the foot of Mt. Blue. He served his community and town as human dentist, castrator of large animals, deputy sheriff, and director of the church choir. On this occasion he drove a distance of five miles to castrate a two-year-old colt and received the magnificent sum of 75c. for his services. On another occasion, the same owner had a more valuable three-year-old colt to be castrated, and as he wanted to be sure of a good job, took the colt to an adjoining town, a distance of five miles and obtained the services of an expert, who used the same methods as the former, but charged the enormous fee of \$1.50.

Those men had no knowledge of pathology, nor of the action of the drugs. Their principal remedies were to replace the "lost cud" with a new one of poplar bark, to bore the horn and fill with some magical agent for "horn ail," and to cut off the end of the tail for "tail sickness," in cattle, and the unfortunate horse was bled, purged or rowelled for every ailment, and even to-day I know of successful farmers who believe in such folly. But such fallacies are fast giving way to the more modern scientific truths.

Such were the conditions at the time the graduated veterinarian made his appearance in our state, and the only wonder is that with their limited knowledge and equipments those men were able to do as well as they did.

When the graduated veterinarian appeared upon the stage of action, he was looked upon with mingled curiosity, awe and suspicion. At the time a certain early graduate located in practice in this state, a well-to-do and progressive (?) farmer remarked that he would not have him in his barn, for he said, "those college chaps know what to carry round to make cattle sick." Then also when the graduate charged living prices for his services, it was thought he was robbing the people.

So the early veterinarian had to overcome the prejudices, suspicions and superstitions of the public, and to educate the layman to realize the fact that the qualified veterinarian had qualifications, and could do work superior to his uneducated competitor.

Since those days the graduate veterinarians of our state have gradually been making progress, both in the quality of their work and in the estimation of the public. While he has often in the past and is sometimes at the present time dubbed as "hoss" or "cow doctor," he is steadily coming to the front, and let us trust the time is not far distant when the profession will assume its rightful place among the professions and in society.

It is true that people admire honesty and sincerity of purpose in others; and the sooner we approach a high standard of manhood and honesty the sooner shall we be honored by the communities in which we live.

When we stop to compare for a moment, the equipment of the old time quack with that of the up-to-date veterinarian, we can realize something of the progress that has been made by our profession in the last twenty-five years. We have to-day surgical and obstetrical instruments galore, their numbers limited only by the size of the practitioner's pocket book; our professional libraries are much more complete than in the days of the early graduate, our therapeutic agents have multiplied in numbers and increased in efficiency, until to-day the up-to-date veterinarian who cares for accuracy of dosage and certainty of results can carry in a small hand case filled with the modern active-principle remedies, more therapeutic dynamia than could formerly be carried in a Saratoga trunk, to say nothing of the sero-therapy, which to-day is only in its infancy, and for which there are doubtless great possibilities in store; with which we will be better acquainted in the no distant future. These things have been placed within our reach by the greater lights of the profession, and it is for us, the rank and file of the profession to use them not only to our own benefit, but in a much larger degree to the benefit of our clients.

While the laity may not realize and appreciate the valuable services of the profession, they nevertheless owe them much gratitude, simply from a financial point of view, to say nothing of the relief they have been able to give the suffering dumb animals. For instance, in the one disease of parturient paresis, the modern treatment, which has without doubt saved the stock owners of Maine enough to pay the entire fees of the veterinarians of the state for their services to cattle since the treatment came into general use, and yet how few even of we veterinarians, when we are treating a case of milk fever, think to give a thought of appreciation to Herr Schmidt for his wonderful discovery much less does the layman or the quack who makes use of it, give credit where credit belongs.

As a single illustration of the progress made in the knowledge of diseases, I quote from a medical work published in 1889. The author says: "The most plausible theory in regard to them," meaning the tubercles of consumption, "is that they are the result of imperfect nutrition. Such a subsistence cannot be produced by the blood when it is perfectly formed. It is an unorganized particle of matter resulting from imperfect elaboration of the products of digestion which is not properly fitted for assimilation with the tissues. "The causes are numerous and varied and classed under two heads: predisposing and exciting. The exciting ones are those capable of arousing the predisposed ones into activity, as spermatorrhea, dyspepsia, nasal catarrh," and the author continues by naming thirty or more others of a similar nature.

We are all familiar to-day with the true nature and causes of this and the great majority of other diseases now affecting animal life. And for this knowledge we should not neglect to honor our experimentors in the veterinary profession as well as in our sister profession, the M. D.'s who are snatching the torch-light of truth from Pasteur and Koch and bearing it onward for the benefit of the suffering man and beast.

I believe we should each one feel a certain amount of pride in the fact that the veterinary profession has and is to-day taking

the lead in discovering the causes and nature of the diseases of the lower animals and in establishing their true relations to those afflicting mankind; and while this work is of untold value to the public even while being carried on, certainly no man living can conceive of the benefit which it will surely bring to unborn generations and to unborn nations.

At an early date in the history of the veterinary profession in the state of Maine, some of the faithful banded themselves together into an organization called the Maine Veterinary Medical Association. This was probably the most important event in the history of the veterinary profession of the state up to the present time.

The object of the association as set forth in Article II. of the constitution is "to be the advancement among its members of a true knowledge of all subjects pertaining to the veterinary science." To this should have been added "and to cultivate a spirit of true fellowship and fraternal relationship among its members, and to secure needed legislation for the mutual benefit of the profession and the public. To these principles the members have been true. Especially to secure needed legislation did the members of this association labor most earnestly and persistently. They freely gave of their time, their money and their talents.

Laws for the control of infectious diseases among cattle and horses have been enacted, milk inspection has been provided, and at the last session of the legislature provision was made for the application of bovo-vaccine, and also an appropriation was made to extend the work of tuberculin testing of cattle, supposedly free to the farmer; but as this was left to the judgment of the board of cattle commissioners, their judgment has not been, so far as I have been able to learn to test many herds free of charge when the work was done by a veterinarian. While this bill was being agitated, it was thought it would give more work to the veterinarian, and thus be to his benefit, but on the contrary it has been to the advantage of the cattle commissioners them-

selves in giving them more work for which they receive daily wages from the state.

And right here let me call your attention to the ruling of the cattle commissioners that they are not to accept a diagnosis on suspected tuberculous cattle with less than three readings of temperature subsequent to injection. But as a matter of fact they themselves, being farmers, diagnose with only two readings, and even make diagnoses on glanders in horses and tuberculosis in cattle on physical examinations.

After repeated attempts and failures, the association succeeded in securing the passage of a practice law. This law while not perfect was without doubt the best that could be obtained at the time, and while it was ostensibly to benefit the graduate, it has proved a great benefit to the quack, in fact next thing to a diploma for those who had ever doctored a sick animal for pay before the passage of the bill. He has passed his examination before the state board, and the state says he is qualified and who shall say he is not?

But let us not despair, for although this law has thus far benefited the graduate very little if any except to give lucrative (?) employment to three of our worthy members, it will if retained upon our statute books result in benefit to the profession of succeeding generations.

These are some of the things the profession has accomplished by the consent of the people.

Let us now briefly consider a few of the urgent needs of the profession, and let me preface these suggestions by saying, and with emphasis, that each one of them is needed by the public even more than it is needed by the profession.

First of all our practice law needs to be revised to the extent that all quacks shall be obliged to state upon their advertising matter the fact that they are non-graduates, for at the present time many quacks are doing considerable advertising and by ingenious wording the unposted layman does not know but what they are graduates. This is only a protection which the

graduate should demand in justice to himself, and the public should demand it for its protection.

We need to charge a fair and adequate price for our professional knowledge and services. I believe it unprofessional and unbusinesslike to cut our prices to get a certain job from a cheap-priced quack, just for the sake of getting the work. Cutting of prices is not conducive to self respect, nor will it aid us in obtaining the respect of the public. In fact, I believe nothing will injure a man's business and his reputation among his clients so much as having "a price for everybody," especially on the same class of work. We need to have more good words for our brother veterinarians. How can we expect the public to have respect for us as a profession if we have not respect and confidence in one another. We can never make a practice and reputation for ourselves by trying to put down our brother competitor.

We need a revision of our milk inspection law. Even the laymen realize that we are attacking the problem of pure milk at the wrong end. Instead of making an analysis of an occasional sample of milk, and calling the work complete, the work should begin at the source of the supply. Given good healthy cows, in clean sanitary quarters, healthy and neat attainments with approved methods of handling the product, there will be little need of adulterating milk; and with the work under the direction of competent veterinarians a pure milk supply would be an accomplished fact.

We need a change in the administration of our laws relating to contagious diseases of domestic animals. We have a fairly good law, but there can be improvements in its administration. The examination and testing of cattle and horses should be left exclusively to the graduate veterinarian.

One of the greatest needs at the present time is a law providing for meat inspection. Our farmers need meat inspection to increase the demand for home raised beef, for at the present many consumers of meat demand western beef because it has passed inspection. The public needs it for its own protection against unscrupulous dealers. I have been told of instances of

local meat men buying cows at \$2.00 on the foot for their local beef supply. If the people could know of the emaciated and even diseased animals which are sold for human food they would rise *en masse* and demand suitable laws to regulate the sale of meat and meat food products. The honest dealer also needs meat inspection for his protection against the unscrupulous dealers.

We need an extension of our state laboratory at Augusta so that more bacteriological work may be done. We should have some place, and the state laboratory at Augusta seems the most suitable, where pathological specimens may be examined for aid in diagnosing diseases. I have several times sent specimens there for examination and word always comes back "we are not equipped to do tissue work."

Few veterinarians care to go to the expense of fitting up a private laboratory for microscopical work, and still fewer who have the means, have the time to devote to that work. Hence it is to the best interests of the state that such work be maintained at the expense of the state.

These are a few of the present and future needs of the profession, and you will all agree with me that they are needed by the public, for we are the servants of the public, and what will benefit us and make us more proficient in our work, must also benefit the people whose servants we are.

These needs should be demanded by the public, and they will be as soon as the people can be educated to see their needs. So then it is up to us as a profession to try to educate the public to realize the necessity for these improvements. How shall we do it is the great question to be solved. One way is as in the past, go to the legislature with our wants. People are eager to know what is going on there and will read whatever can be said for and against measures presented before that body.

Now that our next legislature will be of a different complexion from that formerly, is not this the opportune time to strike for a part or all of these improvements. Since the personnel of our cattle commissioners will most certainly be changed,

it seems as if now is the time to work for some improvements in that line at least.

As a synopsis of the system I would like to see inaugurated in this state I would suggest the following:

In the first place I would abolish our present board of health, our present system of milk inspection and the board of cattle commission.

I would place the administration of these various departments under the control of one board known as the Maine State Sanitary Board, or Department of Health. In addition to the duties performed by these bodies at present, I would add that of meat inspection.

Let this board be composed of one M.D., one veterinarian and one farmer, preferably a graduate of some standard college of agriculture. Let this board have charge of the work and be responsible to the state for the performance of the duties pertaining to this work which properly comes under one department.

For the purpose of meat and milk inspection let the state be divided into convenient districts with a qualified veterinarian in charge of the work in each district, and the whole state under an Inspector in Chief. Let these men devote their whole time to the work in their several districts and receive a suitable salary for their services. Let each district be large enough to require all of a man's time. I would recommend that all samples of milk to be analyzed be sent to the State laboratory by the inspector in charge, there to be tested. You would thus get uniform and reliable tests of samples from all over the state.

The details of such a sweeping bill would require considerable time to be worked out, but I believe this association should awaken to its opportunities and when the next legislature assembles, have something tangible and practical to ask of our new law makers.

DR. P. H. BROWNING, San Jose, California, says briefly in renewing his subscription: "I love my three dollars, but Oh, you REVIEW!"

TRAINING HORSES.*

By F. C. GRENSIDE, V.S., GUELPH, CANADA.

This, the subject of my paper, chosen by the committee, is a comprehensive one, as it would, if taken literally, include training for speed; but as I take it in a gathering of this sort, such an inclusion would be out of place. Leaving out the question of speed, it is still a large order, so that I can only touch upon some of the principles, which should guide us in the education of the horse, and incidentally refer to some of the more important details in carrying them out.

The old term of breaking, used synonymously with training and education of horses, is in a measure objectionable, as it appears to indicate the exercise of too great a degree of force in the process of training. Although harsh measures may be necessary under some circumstances, the guiding principles should be, rather a leading of the colt into compliance with our wills by artifice rather than by force.

Some trainers approach the task in an aggressive mood, prepared and expecting to use harsh measures, while others, and, we think the more successful ones, endeavor to accomplish their object by the exercise of strategy and only resorting to force when absolutely necessary.

Another fundamental principle that should guide us in the training of a colt, is to never place the animal in a position to do wrong, for if he succeeds in acting in opposition to the will of his trainer he is apt to repeat the act, if an opportunity is afforded. As tending to illustrate the carrying out of the principles so far enunciated, let us take the example of a shy, nervous, high spirited horse, easily frightened, and inclined to turn around sharply, to shy badly, and rear or plunge, if restrained.

* Presented at the Ottawa, Canada, Winter Fair.

It is courting disaster to subject such an animal to conditions calculated to frighten him until his mouth is made so that you can control him. He should also have the sharp edge taken off his spirits, by sufficient work in a quiet place, and he should be hitched alongside of a tractable, well trained horse to give him confidence, and assist in controlling him when he is first subjected to sights and sounds likely to disturb him. Every time he is hitched with such a horse his side should be changed, so as to teach him to go, and carry his head straight and get used to the pole on either side of him. Such treatment will soon get him ready for single hitching, without delay.

Never hitch a colt single without the use of a kicking strap, until he has a few weeks' experience, for if he once kicks successfully, he will not forget it. Do not tie up a colt in a place where he can pull back and become a halter puller. Tie him with a strong halter and tie rope and with something to back against so he can't pull back.

These are a few simple examples of the manner in which training can be carried out, upon the principles enunciated. It is much more trouble, and not nearly so satisfactory to have to try and correct faults than it is to avoid their development. The exercise of force is sometimes valuable in nervous, headstrong horses, but never try it unless you are sure of being able to attain your ends. For instance, some horses are very nervous about being saddled and could easily be taught to be buckers. This tendency is not vice, it is nervousness, and by putting a twitch on for ten minutes while saddling and putting a man on the back and leading about with the twitch, the nervousness can be overcome, while such horses get used to the pressure on the back. I have seen this plan save a lot of trouble and avoid bad habits being learned.

It is not necessary to go into any more details, in illustrating the principles laid down, for they have to be left to the common sense, judgment and aptitude of those who do the handling.

We now come to an extremely important point, in the education of a colt, but it is one very imperfectly understood, and

one in connection with which great errors are made, much suffering caused and results in the failure in the attainment of which leads to loss and disappointment. I refer to biting, or the cultivation of the mouth. This organ can undoubtedly be considered as exercising the most important influence in contributing to the control of the horse.

It is not only, however, in influencing control that it exercises its very important function, but also in balancing the horse, in steadyng him, in promoting a graceful carriage of the head and neck, in increasing action and in regulating speed. In order that we can attain all these things through the medium of the mouth, that organ has got to be cultivated until it becomes responsive. By a responsive mouth is meant one that readily yields to the pressure of the bit brough about by the tension of the reins in the hands of the rider or driver.

The mouth responds, whether the pressure is intended to restrain, guide, steady, collect, or alter the carriage of head and neck.

The cultivation of the mouth being of such prime importance in contributing to the reliability, comfort in using, style, speed, balance and action of a horse, it behooves the trainer to give it special attention, in handling a colt, and remember that in the process of biting, it is easily spoiled, and that defects of it are hard to remedy.

There is a marked analogy between teaching a child to write and making a colt's mouth. In both instances you are cultivating muscles and nerves. In one case you are teaching the muscles and nerves of the hand and arm to make smooth lines easily in forming letters; in the other you are educating the muscles and nerves of the head and neck to respond to pressure. Both processes take time, and repeated practice, and the mistake many handlers of horses make is that there is no systematic plan of carrying out the training of the mouth. The bit is usually put in the mouth, and the colt driven before he understands anything about pressure from it, and what it means.

By following out this lack of method many bad habits may result, particularly in sensitive, nervous horses, who readily chafe under any discomfort.

The experience of repeated irritation in connection with the mouth, leads to such bad habits as putting the tongue over the bit, tongue lolling, drawing the tongue up in the mouth, going with the mouth open, crossing the jaws, side lining, pulling, unsteady carriage of the head carrying the head too high or too low, going corner-wise carrying the head sideways, hitching, interfering, mixing the gait, rearing, plunging and running away.

In order that we can make a horse's mouth responsive and steady, it is necessary to get the tongue to stand a reasonable amount of pressure from the bit, as this organ protects the bars of the lower jaw from undue pressure and injury.

In cultivating the mouth the first step is to simply put a bit in it for a few days, to get it used to its presence, then by slow degrees exert increasing pressure on the tongue by the use of reins buckled to the bit, and then buckled back, on either side, to a surcingle. The mistake is frequently made of having these reins too short at first, and thereby exerting too much pressure on the tongue before it becomes inured to it. The reins at first should be only sufficiently tight, so that when the colt holds its head in its natural position the slightest amount of pressure is brought to bear on the tongue but when he sticks his nose out he feels the increased pressure, and the restraining influence of the bit, and he yields to it. Constant repetition of this results in frequent yielding, thus cultivating responsiveness, and at the same time habituating the tongue to pressure. Every day or so the reins can be shortened slightly, thus increasing the pressure by slow degrees, but never sufficiently to tire the nerves and muscles, so that the colt will fight it or hang on it. If he drops his head too low, use a bearing rein, in addition to the other reins, and use a separate bit for the bearing rein.

A couple of weeks of this sort of treatment in a box stall will be a good start in making the mouth responsive. Leading the colt about or lunging him with the biting tackle on will still

further promote the education of the mouth, but you cannot finish the making of the mouth in this way, it has to be done in harness, or in the saddle. A great deal depends upon the delicacy of touch of the driver or rider of a colt, as to the progress the mouth makes in responsiveness. The hand should be light, but steady, the mouth should always be felt, and the colt kept collected, as well as the progress of his education will permit. Loose rein drivers are an abomination, as they teach the mouth nothing, and are apt to spoil a horse's gait. Hitching, forging and bad carriage are promoted by loose rein drivers.

The position of the bit in the mouth is of much moment. It should not be too high or too low, and the trainer has to be guided by the manner in which a horse faces it, in determining its proper location. If the mouth does not yield to the pressure of the bit, lower it, and put it down as low as possible, in order that the animal will still face it with a reasonable degree of firmness and not put his tongue over it. If he shows evidence of doing this and keeps "behind the bit," raise it. Much harm is done by the very common practice of placing the bit too high in the mouth. When it is too high leverage is lost, and you cannot bend the head upon the neck, and get response from pressure. Other untoward results are that the lips are curled up and the angles of the mouth made frequently sore, and the cheeks are pressed against the anterior grinders, causing abrasions and excoriations of the lining of the cheek. Lungers, side-liners, tongue lollers, open mouths, sore mouths, dry mouths, crossed jaws are encouraged by having the bit too high in the mouth.

Another important point in training is giving steady work. Leaving an interval of two or three days between lessons is a very bad plan as the sharp edge has to be kept off a horse's spirits to keep him teachable. A colt never learns anything but bad habits when he is suffering from exuberance of spirits. Give him a lesson in some way every day, and two lessons a day are better than one. It is not necessary to jade a colt, but keep him steadily at it. Two lessons of half an hour are better than one of an hour's duration.

Try to avoid making the mouth sore by using suitable bits in a rational way. As soon as the mouth becomes sore no progress is made. It is better to leave the bit out of the mouth for a few days and lunge the colt to keep him from getting too high spirited.

Before closing I wish to urge exhibitors of horses to get their colts trained to lead well before putting them in the show ring in classes in which they have to be shown on the rein.

It is very annoying and embarrassing to judges to have to pass upon colts that cannot show the character of their action on account of awkwardness in leading and it often militates against their success. It is apparent to observers of awkward exhibitions of leading in a show ring that the handler of the colt often needs as much training as his charge.

Ten or fifteen minutes spent daily for ten days in leading lessons will usually get a colt to go handily.

For ordinary purposes it is not necessary to use a long rein of the expert nagsman as when showing the Hackney, but the rein may be held about a foot from the head, and loosely, but just nagging sufficiently to keep the head in position and regulate the pace.

The leader should run along and avoid looking at his charge, for if he looks at him he will go sideways, if possible, or not lead up. The off side of the horse should be along side of a wall or fence, to make him go straight; a lane is a good place, as the off side can be kept towards the fence going both ways.

A run of fifty to seventy-five yards is ample and a man should be at either end to stir the colt up with a whip, so as to lead up freely. If nobody is available for the purpose, the nagsman can carry a long, straight whip in his left hand, with the point of it directed towards the hocks.

SAN FRANCISCO has won the Panama Exposition by a very large majority; the votes being 259 to 43; which means that the Panama Exposition will be held there in 1915, and "goodness knows" what else!

TEXAS TICK FEVER AND BRAHMA CATTLE.*

BY L. J. HERRING, B.Sc., D.V.S., GEORGIA EXPERIMENT STATION,
EXPERIMENT, GA.

This is a rather old subject, just as Hog Cholera in the way of discussions was, but there were some who felt it still new, and continued to work on it. Drs. Dorset and Niles continued studying the question and decided it was not caused by *B. cholera suis*, and thought hog cholera and swine plague were the same or that swine plague was a complication of hog cholera. This, they proved to their satisfaction. Their results were valuable, as you well know. It was proved that they are caused by a filterable virus, and that hog cholera can be prevented if treated in time with the serum treatment. The results of such treatment is well known. These facts only illustrate why I am discussing this old subject.

One thing is sure, Tick Fever is still with us and is just as deadly as ever to the live stock of the South. By knowing the weak points in the life history of the ticks, ways have been found how to fight them. It has also been proven that no drug or combination of drugs will materially lessen the mortality of the dreaded disease. Have we given up hopes? Is it possible to eradicate the ticks from the South soon? I answer no to both questions. This I will modify, by saying just in proportion to the interest taken by cattle growers, and to their progress in education along live stock and educational advancement, will the ticks be eradicated, especially in the non-stock law districts. The lack of education and interest, are not the only barriers, the long summers and lack of cold enough weather to destroy young ticks, which make good environments for the tick to survive under are great natural ones. For these reasons we must not give up hopes of some day finding a specific for piroplasmosis bovis. However the ticks must eventually be eradicated.

Now let us look at some of the recent advancement along the line of treating syphilis, sleeping sickness and canine piro-

* Presented at the Georgia State Veterinary Medical Association, December, 1910.

plasmosis. These diseases are caused by an animal micro-organism, so is hemoglobinuria. Prof. Paul Ehrlich has found, after diligent work, a specific for syphilis; for short he calls it "606"; the chemical name is dioxydiamido-arsenobenzol. He also found one for sleeping sickness; had he given up hopes, these never could have been found; I mean so soon, for some one equally as persistent would have done so. The results are not hearsay, they are reported. Pick, a German, treated 120 cases of syphilis, and only two recurred. Isaac treated 27 cases, none recurred, but all were bad to start with. Kroymer treated 17 cases, 5 recurred and 3 others were some time reacting to the treatment. Herxheimer and Schonnefield treated over 200 cases with but one recurrence. Reports taken from *A. J. of M. Science*, December, 1910. The success following treatment of sleeping sickness is as sure or more so than syphilis. He calls the specific for sleeping sickness "418," or arseno-phenyl-glycin. Treatment of canine piroplasmosis has yielded good results, with trypanblau in Dr. Geo. H. F. Nuttall's work, of Cambridge, England.

With these facts in view, surely there is a great field for some one to find a specific for piroplasmosis bovis. Dr. Geo. H. F. Nuttall and S. Hadwen, of the University of Cambridge, have been experimenting on cattle affected with Tick Fever, the results are wonderful. All the cases they treated, they made the cattle sick by inoculating them with blood from an animal that had recovered from the fever. They obtained typical hemoglobinuria symptoms. They used nine cows, four were used for controls and five for treatment in this experiment. One of the four controls died and the other three had hemoglobinuria.

Trypanblau was used for treatment. It is a deep blue stain slightly soluble in water. A saturated distilled water solution is made, and injected into the jugular vein, from 130 to 200 c. c. at a time. One injection should be enough. It is better to inject it in the jugular as it gives better results; however, it can be injected subcutaneously and more must be used. If small amounts are injected, the germ becomes seemingly immune to the drug, and will not react to its curative effect.

The cows treated were numbered 1 to 5 inclusively. Each cow was inoculated with 30 c. c. of virulent blood from an immune cow, except No. 5, which received 200 c. c., subsequently receiving 30 c. c. more virulent blood from a cow that had just died. These cows reacted to the inoculations quickly except No. 5, which seemed resistant. No. 1 on the fifth day received 200 c. c. of saturated solution of trypanblau in jugular vein; No. 2 on the sixth day 130 c. c.; No. 3 on seventh day 150 c. c.; No. 4 on seventh day 150 c. c.; No. 5 on twentieth day 180 c. c. In each case the temperature at time of treatment was from 105 to 107 degrees and parasites were found in the blood. All cows treated got well. No. 4 was killed on the twenty-third day when temperature was normal and cow doing well, no parasites were found in smears from spleen, kidney or liver; the subcutaneous tissues were stained blue.

The temperature went down soon after the injection of the stain. Hemoglobinuria occurred in each case.

The results of Dr. S. Dodd's work on "Redwater" at Brisbane, Queensland, Australia, are convincing. The following is a summary of his results.

He first used trypanred, as that was all he had at that time, on four cows, using one as a control. In each case he injected 45 c. c. of defibrinated virulent blood which produced a severe case of the disease. He treated the animals by injecting 100 c. c. of the saturated solution of trypanred (2 grms. to the 100 c. c.). Two of the three treated and the one control died of redwater. By February the second, 1910, trypanblau came and a new series of animals were put in. Experiment No. 1, five cows were used, all were inoculated with 60 c. c. of virulent blood, three were treated and two were left for controls. One of the treated and the two controls died. The treatment was not used until the animals were sick enough for an owner to notice it, as Dr. Dodd is trying to make the treatment practical. Experiment No. 2—About the same time three pure bred Devon bulls were sent to Queensland from England, for breeding purposes. They were inoculated in the usual way, by injecting them with 5 c. c. of viru-

lent blood and taking care of them in the old way; two of them became so sick that death was feared; trypanblau was used subcutaneously on all three. You note he did not inject them intrajugularly. All got well, but Dr. Dodd thinks two of them would have died had it not been for trypanblau. Later, Experiment No. 3.—Seven more cows were inoculated with 50 c. c. of virulent blood each; trypanblau was used on all but one as a curative, which seemed not to have needed it, all got well. Experiment No. 4—Eight more were inoculated in the same manner three times, as it did not take so well, but the reaction did not warrant the use of the drug. He accounts for this by the fact that these (Experiments 3 and 4) fifteen cattle were bought of an owner who said they had never had any ticks on them, but had been infected at a time when the owner did not know it.

The conclusion is that trypanblau is a very efficient remedy for tick fever, but must be tried out and perfected by experiments, until it proves practical and convenient in the field. There is a great future for it. Since such work has been done so successfully in England and Australia, I think it can be done here in Georgia or elsewhere, if ticks exist. I am going to try it out fully at the Georgia station. Those who want to eradicate the tick may try to discourage me, but the treatment must be worked out if possible. I want to see the ticks eradicated, and believe that will be the final solution of the question. Ticks must be eradicated. Aid must be given those, if possible, who cannot get rid of the ticks in many years to come. Such localities as South Georgia and Florida are good examples, especially where there is no stock law.

I have done some work here with trypanblau as a curative agent, but on account of not using large enough doses, good results were not gotten. My work proves that small doses repeated often will not accomplish any thing.

THE BRAHMA CATTLE.

The Brahma cattle have been before the public for some time, as cattle immune to tick fever, by hearsay. It seems that they

have not been fully understood. The occasion presented itself to me, to visit a ranch in Texas where pure bred zebus were imported from India. The ranch I visited is the T. H. Pierce Estate, at Pierce, Texas, controlled by Mr. A. P. Borden, who went to India to get the cattle, with the permission of Secretary Wilson of the Department of Agriculture, that he could import them subject to the quarantine regulations. After much difficulty in getting the cattle by the quarantine at New York, he landed one-half the number he started with (the other half having being killed by inspectors) at Pierce, Texas, in the fall of 1906.

The Brahma cattle are not immune to Texas tick fever or at least I do not think they are. It is true that very few, if any, ticks at all come to maturity on them. This is the big claim for them in regards to ticks. Where there is $1/16$ Brahma blood in the cattle the same is true. I am convinced from what I saw that this is true. On this ranch there are thousands of grades and some pure bred Brahmams and native cattle. All the cattle with Brahma blood in them were in better condition, carried less young ticks and were more active than native cattle. They also stand the tropical and semi-tropical pest and diseases better than native cattle. The pure-bred Brahma bulls are crossed on native pure-bred beef cattle.

These points are not the only ones in favor of them. Mr. Borden is in the cattle business for the money, and he would not be getting zebus from India at his own expense, if they were not money makers. He had some grades before the recent importation, consequently he was not making a leap in the dark. I think these cattle are good for South Georgia and Florida, especially for beef purposes when crossed on native beef breeds. They give a fair amount of milk, enough for farm use, but not enough for dairying. My work with grade Brahmams shows they are tick resistant in as much as ticks do not come to maturity on them.

This line of work is of particular interest in the South.

RHEUMATISM.*

By I. L. SALLY, D.V.S., SKOWHEGAN, ME.*

I selected this subject, not because of what we know about it, but rather because of the little that appears to be known as to the actual cause of this disease. The history is not important; suffice it to say that it probably has been known as long as any disease and is as old as the animal kingdom itself.

Divisions.—Rheumatism may be divided into acute, muscular and articular; and these may each become chronic, but I shall treat principally of the acute form.

Etiology.—Rheumatism is particularly frequent in the equine, bovine and canine species. It is favored by cold and dampness, cold winds and draughts, badly kept stables, damp pastures, sudden chills of the over-heated body, very cold baths, etc.

Little exercise and heavy feeding as well as over-fatness predispose animals to rheumatism. When we come to consider the actual causes we find various opinions.

Dr. Gresswell says rheumatism is a general disease, the proximate cause of which has been maintained to be a poisonous substance circulating in the blood; this poison is stated to be lactic acid or some other acid. No excess, however of any such acid has yet been detected in the blood.

From Dr. Zuill translations of Friedberger and Frohners we have the following: "At the present day it is no longer possible to consider the suppression of the cutaneous perspiration—a consequence of cold as the cause. This has been said, by its arresting the elimination of the products of tissue waste, to result in a dyscrasia, ultimately producing inflammation of the muscles. The hypothesis of an increase of the lactic acid production is no more

* Presented at the October, 1910, meeting of the Maine Veterinary Medical Association.

to be maintained than the preceding theory. Experimental suppression of the cutaneous function by varnishing, and the artificial introduction of lactic acid into the muscles have never produced rheumatism. They further say that articular rheumatism is probably caused by an infection both in our animals and in man and that cold interveges as an occasional cause.

Dr Alexander Hague in his investigations upon uric acid as the cause of disease in man says, "I have found not only that an attack of gout and rheumatism can be produced by giving acid, but that all substances, which increases the solubility of uric acid increases its excretion in the urine and do good in those joint troubles which are due to its irritating presence, while conversely all substances which diminish the solubility of uric acid diminishes its excretions in the urine and also increases those irritations in joints and other fibrous structures which are due to its presence."

Dr. Galon a early as the latter half of second century was of the opinion that rheumatism was caused by the accumulation of matter in the parts affected. These matters were supposed to be phlegm, bile, blood, or a mixture of these fluids.

Dr. Hague found that excess of uric acid in the blood and body are almost never due to increased formation but to failure of excretion or retention; also that alkalies increase and acids diminish the excretions. Uric acid excreted by the urine comes from two sources; the uric acid formed in the body out of nitrogenous food and uric acid introduced into the body in meat extracts, soup, tea, coffee, etc.

Dr. I. M. Shepherd, of St. Francis Hospital, says acute rheumatism is an infectious constitutional disease possessing the peculiarity of manifesting its marked processes locally in the fibrous and serous structures of the motor apparatus engaged in facilitating active movement. Equally characteristic of the effects of this rheumatic poison is first, its irritation of the muscle to the production of an excessive formation of lactic acid in the system—a condition which does not happen in any other disease.

Second—The pronounced increased deposits of urates in the urine, and

Third—The absence of uric acid in the blood.

The striking resemblance of an attack of acute rheumatic synovitis to a scarlatinal synovitis, and of an acute rheumatoid arthritis to a pyemic arthritis suggests a similarity of cause—bacterial infection. The joint inflammation of a pyemic infection is abridged by speedy death. When the inflammation is allowed to proceed it leads to suppuration. The tendency of all inflammatory swellings caused by an infection arising from without the system is to suppurate.

The rarity of suppuration from an inflammatory swelling from acute rheumatism suggests a bacterial infection from within the body.

Dr. Shepherd also says that the blood does not contain any uric acid during the period of the infection and prior to the crisis of acute rheumatism.

Considering these facts it is my opinion that acute rheumatism is an auto-bacterial infection that starts in that process of retrograde metamorphosis involved in the formation of uric acid.

Dr. Dacosta says in a few instances we find acute arteritis arising and especially inflammation of the fibrous structure of the aorta.

So, gentlemen, you see opinions differ so much as to the actual cause of this disease that it is very little we really know about it. But may not the facts be that all are partly right in what they think the cause to be. May it not be caused by uric acid in the system as many think; and the infection or whatever else might produce a rise of temperature, influence either the production or the excretion of uric acid and possibly both. It seems to me it is reasonable to suppose this theory may be the correct one.

Pathological Anatomy.—In muscular rheumatism there is no alteration in benign cases; in more serious cases we observe all the symptoms of myositis, hyperemia, hemorrhage, a serum exudate in the interstitial connective tissue, softening, discoloration, and segmentation of the muscular fibres.

In articular rheumatism the principal alteration is serous synovitis; purulent synovitis is only found in exceptional cases.

The synovial membrane is red, hemorrhagic, are thickened, tumefied, and strewn with turgescent villi, which are of a dark red color. The synovia is increased in quantity, the cartilages are of a rose tint at the beginning, later they become yellowish; their surface is velvety.

Symptoms.—In the horse the symptoms are ordinarily located in certain muscular groups, most commonly those of the extremities. The limb is extended, held stiff; the affected muscles sensitive, tumefied and hard.

One of the characteristic symptoms of rheumatism is its migratory character, which passes abruptly from one member to another; or from one joint to another.

We must not rely too much, however, on this in our diagnosis for this symptom is sometimes absent.

In articular rheumatism we have the inflammation about the joints. Tumefaction is very common; this usually appears abruptly, sometimes in one night they acquire great size. They are most often in several articulations, most commonly the knee, hock, or stifle joint.

Treatment.—The treatment of this disease varies as much as its etiology. Hot applications are safe and they surely give some relief in muscular rheumatism. Stimulating frictions may be used with benefit, but in this case probably the massage has more to do with it.

Protection from cold, dampness, and drafts are important. If the disease has become chronic, vesicants may be of advantage. Iodine, cantharides, biniodide ointment, etc.

In man considerable relief has been obtained by paradise seed in alcohol, well rubbed in.

As for internal treatment something to aid the elimination of the urice acid seems to be the proper thing. Salicylic acid, salicylate of soda, salol, antipyrine, etc. A good diuretic and physic ball are good treatments.

DISEASES OF YOUNG ANIMALS.*

BY DR. THOS. FARMER, GRAND BLANC, MICH.

This paper is more of an inquisitive than instructive nature. I do not think in all the time that I have attended these meetings which must be in the neighborhood of seven or eight years, have I ever heard the diseases of the young animals discussed, and it is for this reason that I bring it before you to see if we could not be mutually benefited. In the diseases of young animals it is the foal that I think the majority of us are most interested in; and he it is that has given the most trouble, and no doubt you have all had the same anxious and unsatisfactory experiences that I have had; but I hope you have had better success in treating them. Why the foal should be more liable shortly after birth is something I hope to learn; or at least should very much like to. Fleming in his work on obstetrics claims that the calf is more subject to pervious urachus than the foal. This has not been my experience, for in my own practice of twenty years, I cannot call to mind but one case of pervious urachus in the calf, while it is of common occurrence in the foal. The list of diseases are numerous in the foal. We have pervious urachus edema of the umbilicus, inflammation of the umbilicus, bleeding from the umbilicus, etc., all of which are amenable to treatment. Now inasmuch as there was a paper read last year in Lansing on scrotal hernia in the foal, I would like to say a word. Hernia in my opinion is very rare, but the enlargements are very common; I have never had to interfere, I believe, but in two cases; those I found strangulated and by reducing them, and by applying a compress and keeping it there for two or three days, they came out all

* Read before the Michigan State Veterinary Medical Association, Saginaw, January 26, 1910.

right. Unqualified and unscrupulous men travel the country, and every enlargement they see in a foal, they make the owner believe it must be operated on, when he had better pay them to let it alone; or better, set the dog on them. Several times I have been called after these fakirs had been there and had the owner pretty well scared, but he would feel better after I explained matters to him, telling him it would be all right when a year old. But the main object I have in view is to gain all information I can concerning the, to me, dreaded disease arthritis, so very common to young colts, at least in my locality, of which I find two varieties; one I term rheumatic and the other scrofulous. The rheumatic form shows itself from one day to two or three weeks old; it will be noticed by swelling perhaps in one joint first gradually going from one to the other, accompanied by soreness and constitutional fever, grows gradually weaker and finally succumbing to the disease. The scrofulous form develops at any time up to six months old, after which time it is very rare. Colt may appear all right, when all at once he will become lame in one limb, mostly always a hind one. Appetite usually good for a time, even after he is unable to get up alone, and invariably dies. On post mortem will find the joint filled with ichorous pus, cartilages all absolved and bones necrosed.

The next bugbear is the great, fat, fine looking foal; seems all right for a short time, suddenly takes a notion to lie down and sleep; for a time he will get up and suck, later on you will have to make him get up; still later have to help him, and finally will not suck when you get him up, but all the time seems to suffer no pain whatever, but just seems to sleep himself away.

Such colts are generally born with a very large umbilicus. In my opinion the smaller the umbilicus the smarter the colt and the sooner he is on his feet and looking for the teat. This kind is generally thin in flesh, while those with the larger umbilicus are generally fat and flabby. Now in the first two, viz., rheumatic and scrofulous arthritis, the surest cure is prophylaxis. For this have your mares foal later in spring, so that they can foal out on the grass, for it is in those foaled indoors where this disease pre-

dominates in some filthy old shed perhaps. And when we consider the structure of the umbilicus, consisting as it does of two arteries and a vein, together with the large opening of the urachus, all serve as a railroad for the admission of germs. In view of this, it is a good plan to have a good strong disinfectant ready to apply to the naval at birth and daily until the healing is complete. I think I have averted several cases of joint disease by this procedure, and notably so among lambs.

When the disease does develop, my treatment is antistreptococcic serum injected hypodermically, at the same time giving the mother a draw of potas. iodide twice daily. Since adopting this treatment the fatalities have been a great deal less. Now the third disease (I do not know a name for it), I mean the one that sleeps himself to death, is the one I would like to discover a remedy for; as yet I have found nothing tangible. Last year I began on a line of treatment consisting of injections of strychnine, Park Davis' cardiac tonic, and neuclin solution, but did not see my patients early enough in the disease for a fair trial, so will continue it next season and hope to get some in the early stages of the trouble.

The best I can do at present is to give my opinion of the cause, be it right or wrong. By close observation I find it very rare in the calf and pig, but very common in lambs and at intervals in the foal; you all know it is no uncommon sight to see a number of lambs lying dead around a barn yard. So reasoning from this, I have come to the conclusion that it is caused by over copulation. I am informed that a ram will cover fifty or sixty ewes in a single night, and very likely some of them more than once, while the stallion is often bred to several mares in a day. The bull, on the contrary, is very rarely overdone in this respect. These are my reasons for believing that this living death has its origin right at the time of fecundation.

Summary.—Restrict your stallions to two mares a day; in your larger flocks put two rams where now you have only one; use your disinfectants persistently from birth till naval dries up on colt and lambs, and in my opinion you will have taken a

long stride towards eradicating these dread diseases and at the same time adding numbers to our live stock and increased wealth to our individuals and to our state at large. I presume the foregoing will be disputed by some, and I hope discussed by many, for it is not from papers, but from discussions that we get our information (especially this one; for by this we get the experience of many, while the best a paper can do is to give the experience of one.

ARTHUR L. WOOD, D.V.M., Assistant State Veterinarian, Hampton, Ia., in renewing his subscription to the REVIEW, writes: "Here is where one surely gets his value received. It is with pleasure that I forward you \$3 to have my name on your mailing list for another year. I am much pleased to note the advance the REVIEW has made and is still making."

THE January meeting of the Missouri Valley Veterinary Medical Association at Kansas City, was, as the REVIEW predicted, one of the best in some time. The papers were good and the discussions brought out by them very interesting and valuable. Our readers will be furnished with a full report of this important meeting in our next issue.

The Idea, Lexington, Ky., February 9th, gives an account of the use of the X-ray in a case of persistent lameness in the pastern of a trotting stallion under the care of Dr. Jas. T. Shannon, of Lexington. Dr. Shannon had the horse taken to the University of Kentucky, where Prof. Pence took a very satisfactory picture of the pastern joint. The owner of the stallion had an idea that some foreign material, such as a piece of wire or nail had penetrated and broken off, which accounted for the persistence of the lameness. Through the use of the X-ray, Dr. Shannon was able to convince his client that such was not the case. *The Idea* concludes the article by saying, "this is probably the first time that the X-ray was ever used for such a purpose."

[The clinical application of the X-ray, on account of expense and other reasons, certainly is not general; but we had the pleasure about two years ago of seeing, by the aid of the X-ray, an iron rivet in the digestive tract of a puppy, at one of the meetings of the Veterinary Medical Association of New York City.—En.]

RABIES.

BY W. W. YARD, D.V.S., DENVER, COLO.

A rabies scare is about to be the means of having all the dogs killed if some foolish and inhumane persons could have their way in the country and city. Two years ago Dr. H. H. Bird of the R. V. C., was called to see a cow which he pronounced to be rabid; this was about 125 miles in the northern part of the state. He held an autopsy and sent the brain, etc., to Dr. B. F. Kaupp, pathologist at the State Agricultural College at Fort Collins, and after the usual laboratory work and inoculation of guinea pigs the disease developed. Later on Dr. Kaupp received more specimens, and after a careful investigation he found in all the cases a direct history of dogs being in the vicinity. After this he says he received two horses, two cows and eight dogs from the same city. The dogs had bitten people, and as a check against his laboratory, two inoculations were made; both rabbits went off their feed on the 14th day and on the 17th day one died, and on the 18th the other. The Negri bodies were found in both the brains, thus confirming his diagnosis. The two persons were advised to take the Pasteur treatment. A report was made to the city of Greeley and they passed a muzzling ordinance; this was done and the specimens of rabies ceased to appear at the college for investigation.

One dog was sent from Loveland, one from Fort Lupton, and there have been at least 125 specimens sent to the laboratory of the State Agricultural College and the state university, and in nearly every one the report has been rabies.

We are writing now for information as regards the probability of this disease being rabies. Part of the professional men think light of the idea and a number of physicians and also prominent veterinarians say they have not only their own ideas about it, but their clinical observations, that it is surely rabies.

We know that in 1906 there were about fourteen states of the east in which rabies was reported. This is about four years, and

if the authorities of the universities and the government pathologists of the East say that they had it there, is there any doubt as to why it could not appear in the western states.

In the last six months there have been about three hundred cattle belonging to the farmers and dairymen around Denver that have been reported by the veterinarians as having rabies, and in almost every case they have traced the time when some dog has been around.

The clinical observations have not been entirely diagnostic in all cases as that of rabies, but what is it if it is not rabies? This question can be decided later on, but the thing to do at once is to control the dogs and other animals that might have it, until it can be decided what it is; and there is a great chance that it will be found to be rabies in almost every case. Not because a dog bites is it rabid, but in many cases the dogs have gone mad after the biting.

In the late nineties, I was house surgeon in the hospital of the American Veterinary College, New York, under Prof. A. Liautard. The night before the house surgeon on inside duty had accepted a dog which he thought was mad and shut it up in a box stall on the second floor. The next day was my first day of the new work to go on inside duty, and it was the practice of Dr. Liautard at the change of watch every Monday morning, to visit each ward and each patient, there being about eighty all told. As we started up the stairs from the office this dog gave a peculiar bark which neither of us had heard as yet; when this gradually died away the doctor turned to me and said, "Doctor, take notice of that bark the next time, as I am almost sure it is a case of rabies"—although he had not seen it. Upon the return of the house surgeon who was in charge the week before, he obtained the history and sure enough it was that of rabies; the dog died in a few days. The brain, etc., was sent to the City Health Pathologist and it was pronounced a case of rabies. This will show what experience will do in making, or drawing a person to making, a suspected case of rabies (The bark is a diagnostic symptom.)

REPORTS OF CASES.

DIVISION OF THE FLEXOR PEDIS ACCESSORIUS TENDON AND ALSO THE PERONEUS TENDON FOR STRINGHALT.

By A. B. ELLIS, D.V.S., Los Angeles, Cal.

So much has been said about the operation for stringhalt. Everyone I have ever consulted seems to think after the peroneus tendon was divided there was nothing else to do. Some writers recommend operating above the hock and others below it. I have also heard it said that some operators have divided the fascia of the thigh just in front of its union with the extensor pedis tendon. Personally I have no faith in this procedure. What is the cause of stringhalt? It is quite certain that the movement is involuntary. It must, therefore be dependent on some mechanical operation to overcome this condition. I have not had the opportunity of operating on many of these patients; but have only had one failure out of three cases. I have seen practitioners divide the peroneus tendon time and time again without the result. When you study the action of the flexor pedis accessorius tendon and the tendon of the peroneus, you find the action almost the same. The flexor pedis accessorius tendon joins the perforans at about two-thirds the distance from its commencement; and the action of the perforans is to flex the phalanges and assist in extending the tarsal joint. The peroneus joins the extensor pedis and assists this tendon to extend the entire digit. The flexion and extension of the hind leg is very complicated, and as I have said, the division of either of these tendons only has a mechanical action. Now, we all know where the peroneus tendon is, and almost any of us can find it with our eyes shut. But to locate the flexor pedis accessorius tendon we have to go to the other side of the leg. This tendon runs down the inner aspect of the hock, very superficial, just anterior to the tendon Achilles. Anybody that has

ever done neurectomy of the anterior tibial nerve, has picked up this tendon more than once. I make my incision just as though I was going to do the anterior tibial operation, only just a little anterior; this is the best way I can explain this operation in a surgical way. Any student that has dissected these tendons out recently and is familiar with them, will have no difficulty in locating them. Now, the way I look at this operation is, if I were going to operate for stringhalt I certainly would divide both of these tendons. I do not think our textbooks mention the division of the flexor pedis accessorius tendon. It has been experimental with me, and I would like to have somebody else try it. I have faith in the operation and it is very simple to do.

BOWEL STRANGULATION.

By F. C. MECKSTROTH, M.D.C., St. Mary's, Ohio.

On morning of April 10, 1909, while practicing with Dr. Fred. Miller at Fort Recovery, Ohio, was called to attend a sick four-year old mule. After arriving at the place and inquiring into the history of the case, was informed that the mule had taken sick the previous evening; and, according to symptoms, was suffering from some digestive disturbance. The animal seemed to be relieved when lying on its back with the legs extended up against the wall of stall, and would remain in that position almost continually; occasionally it would put its head to its side and groan as if in great pain. Peristalsis was present in large bowels with no evidence of accumulation of gas in them. Pulse and respiration was slightly accelerated. On account of the extreme pain the mule was given anodynes which were followed by enemas and a dose hypodermically of one of the active alkaloidal cathartics. Being almost certain that the mule was suffering from some fatal condition according to the symptoms shown, and the peculiar action of the mule, anodynes were left to be given and he rested comparatively easy the rest of the day and the following night. The following morning, another trip was made and found the mule on his feet but pulseless; temperature, 103 degrees; no peristalsis, and respiration about 30 to 35 per minute; after a stay of 20 to 30 minutes the mule died. Being very much interested in the case from the peculiar symptoms that were shown a post mortem

was suggested. Both abdominal and thoracic cavities were opened; the large intestines were the first organs examined and nothing abnormal could be found. The small intestines, diaphragm, and thoracic organs were next examined. An interesting condition was found in the diaphragm; it had a round opening in it about $1\frac{1}{2}$ inches in diameter through which six feet of the small intestines had looped through and become strangulated. The texture of the diaphragm indicated an abnormally weakened condition; for on the thoracic side of it was a tumor-like enlargement about the size of a goose egg. This enlargement was composed of indurated liver tissue. The liver itself was attached to this enlargement, with the diaphragm between them. The question arises how did this liver-like tumor get in the thoracic cavity? It appears as if the diaphragm degenerated and weakened at this place allowing the liver to perforate which at the same time closed the opening and adhesions followed; for the liver was attached to diaphragm at this place. This condition from all appearances had existed for some time. The stomach was distended, due to the obstructed small intestine. The place where the intestines escaped through diaphragm was abnormally thick and rough. Digestive disturbances with continual pain, no bloating and a peculiar recumbent attitude, as this mule presented, should always suggest the thought that a fatal obstruction of small bowels is present which can only be confirmed by holding a post mortem.

UTERINE POLYPUS IN PREGNANT COW.

By WM. J. RATIGAN, O.S.U., Oswego, N. Y.

During the month of January, while riding in the practice of Dr. John H. Summers at Oxford, Ohio, we were called over into Indiana to attend an obstetrical case in a cow. Found an aged Holstein cow of medium size, in attitude of much tenesmus. One calf had been expelled; with it the large tumor, which was outside the orifice, its short peduncle attached internally to the superior internal surface of utero cervix, just within the os. By drawing tumor back and upward toward root of tail, further examination was permitted, which revealed another foetus. This was easily delivered, but natural efforts were prevented by the fibroma. Although the well developed thick cap-

sule of tumor presented a grey tinge, it was evident the interior was very vascular, as the palpitation of the good-sized nutrient vessels through peduncle indicated. The retained placenta were removed and on account of weakness of patient and danger of hemorrhage, it was thought best to await following day to remove growth. This was done the next day by means of ecraseur and astringent packs were introduced to bleeding surface. Next day several large tenacious clots were removed and genital tract flushed. Heard from case a week or more later, both cow and good-sized twin calves were O K. It seemed peculiar that the traction on the foetal membranes did not leave a deformity in one of the calves at least. Or, that the frequent straining of cow for over a year due to the foreign growth did not prevent the cow becoming pregnant or cause abortion. The tumor was twelve inches in diameter, and weighed $14\frac{3}{4}$ pounds. It exhibited a well-defined hilum, to which peduncle attached, around which beneath the capsule was a well developed cartilaginous ring.

THE Colorado State Veterinary Medical Association is taking an interest in furthering the passage, by the present legislature, of efficient sanitary laws and an appropriation for the veterinary section of the State Experiment Station.

DR. CHAS. H. HIGGINS, pathologist in charge of the Dominion biological laboratory at the Experimental Farm, Ottawa, Can., is suggested as one of the members of a commission on water purification. The names of the other distinguished gentlemen of the commission suggested are Dr. Chas. A. Hodgetts, chief medical officer of the commission of conservation, and Major Drumm, M.D., officer in charge of the P. A. M. C. laboratory and health of the Canadian militia units. The Dominion government is vitally interested in Ottawa's water supply, as several parliamentarians and members of civil service are at present down with typhoid. "It was learned on good authority this morning," says the Ottawa *Evening Citizen* of February 6th, "that the Dominion government would be prepared to loan to the city of Ottawa the aforementioned three authorities on bacteriological diseases, as a commission to investigate the typhoid fever outbreak here, and to co-operate with the city in empowering them to report as to the causes and to make recommendations regarding the prevention of a recurrence."

ARMY VETERINARY DEPARTMENT.

VETERINARIANS ON THE RETIRED LIST.

The *Army and Navy Register* of February 4, 1911, brings the following note under the above caption:

" Senator Penrose's amendment to the Army Appropriation Bill provides: 'That hereafter so much of Section 20 of the act approved February 2, 1901, as provides that veterinarians shall receive the pay and allowances of second lieutenants, mounted, shall be interpreted to authorize their retirement under the laws governing the retirement of second lieutenants.' "

REMARK.—We hope this amendment to the Army Appropriation Bill will pass. It is very desirable and necessary at the present time. Chairman Turner, of the Legislative Committee, telegraphed on February 8 that the Senate passed this amendment and that it went over to the Conference Committee. The final result will be known early in March. There was absolutely no chance for the passage of the bill "to increase the efficiency of the veterinary service," and it is hoped by many that its continued failure will now mean its final death.

THE RECOMMENDATIONS OF THE BOARD OF OFFICERS TO REVISE THE VETERINARY SUPPLY TABLE.

A Board of Officers appointed to meet at Fort Riley, Kansas, to revise the Veterinary Supply Table of February 26, 1902, consisting of Major Nicholson, Cavalry; Major March, Field Artillery; Captain A. N. McClure, Cavalry, and Veterinarians Plummer, Jewell and Schwarzkopf, held daily meetings, between January 16-30, 1911, and completed and forwarded the proceedings for approval by the proper military authorities. The order detailing the writer as an additional member of the board, came as a complete surprise, but was followed with pleasure and anticipation.

Without intention to divulge official proceedings, an extract of the recommendations of the board is given below for the information of the many army veterinarians who appeared to be

much interested in the matter. The principal new features recommended are as follows:

That twenty-five cents per quarter for each animal be authorized for the purchase of veterinary supplies. At posts where veterinarians of cavalry, field artillery, or the Quartermaster's Department are stationed, ten cents of the allowance for each animal may be used by the veterinarian for the purchase in open market of such medicines and dressings not on the supply table as he may need to meet conditions requiring a special line of treatment, the amount to be available for immediate use in garrison and field service upon the approval of the commanding officer. The money allowance per head per quarter was raised to thirty cents for use in the tropics.

In the preparation of the regular quarterly estimates, the Quartermaster and Veterinarian are to be governed in the money allowance by the total number of animals entitled to veterinary treatment and a current price list of supplies on the supply table, furnished by the Quartermaster's Department.

The old allowance of veterinary supplies for 100, 200, 300 animals was dropped.

A veterinary supply table was retained as it was considered necessary to insure a basic supply of standard drugs and dressings of uniform kind. Some veterinarians had suggested to abolish entirely the supply table, while others wanted it greatly enlarged. Either of these two suggestions was found to be impractical, but several rather obsolete drugs were stricken out, while a few new ones were added. The reserve fund of ten cents per animal can solve the problem for each veterinarian to procure all those medicines, etc., which appeared to be individual choice, and they were widely divergent indeed. There was almost unanimous complaint about the deterioration of hypodermic tablets and hereafter these must be supplied in sealed tubes with five tablets in each tube of uniform size.

Under dressings an unstained flannel bandage was substituted for the red flannel bandage which has held its sway in the army ever since the Civil War in spite of protests during thirty-seven years, a characteristic instance of army conservatism.

Instruments and dispensary equipment are to be issued on memorandum receipt to veterinary hospitals or to veterinarians of cavalry, field artillery and the Quartermaster's Department stationed at posts and remount stations having no veterinary hospitals, but sufficient facilities for proper care. A number of

new instruments were recommended, mostly for operative technique, of which the Quartermaster General had shipped samples for trial and report. They had previously been tested by Drs. Plummer and Jewell. Medicine droppers, thermometers, needles, extra blades for dental floats were made expendable articles.

The veterinary field equipment, which had been absolutely unsatisfactory for several years past, was made entirely new to fit modern conditions. A pattern of a set of five chests (ammunition box size) has been worked out by the board, which is well adapted for promptly administering veterinary treatment to animals of a moving column. The chests are carried on the English model pack saddle, which steadies breakable contents. One set is to be supplied to each veterinarian of cavalry and field artillery, to be regimental property. This would provide each veterinarian with ample supplies and an "assistant" on the march.

A saddle-bag for veterinarians was also adopted after a German army pattern furnished to the board by Veterinarian Grutzman, Fifteenth Cavalry. It is a neat, handy contrivance, containing an emergency outfit consisting of a vest-pocket instrument case, hypodermic syringe, hypodermic tablet case, nose twitch and tourniquet combined, small tin basin, etc.

A farrier's and horseshoer's field equipment was also recommended, but no method of carrying these supplies, because the Cavalry Equipment Board at Rock Island Arsenal is considering this subject.

Eighteen standard veterinary text-books and journals were recommended as a library for veterinarians.

Laboratory equipment, consisting of such articles as incubator, hot-air sterilizer, steam sterilizer, microscope, filters, flasks, etc., are to be supplied only on special requisition of a veterinarian with the approval of the commanding officer. This subject was considered at length, because a number of veterinarians seemed to lay stress on being supplied with equipment for making bacterias, etc., but official correspondence showed that any such scheme would be disapproved. It was finally recommended to make the laboratory of the Mounted Service School at Fort Riley the centre of manufacture and distribution of these modern preparations to supply the apparent demand by veterinarians of the line.

Several other suggestions made by veterinarians, such as rendering quarterly reports to be compiled into an annual re-

port; the institution of veterinary courses at the Mounted Service School, etc., were not thought to be proper subjects to be embodied in the proceedings of this board. But it can be authoritatively stated that hereafter young veterinarians, newly appointed, will be ordered to undergo a course of instruction in equitation and army veterinary practice at the Mounted Service School before joining their regiments.

The Board worked hard. There was at times a little fire in the air, just enough to keep up spirits, but otherwise all through earnest wish for improvement was evident and strenuous labor the order of the day and even night. The enthusiastic, yet prudent help of Captain McClure was of the finest type. It is not probable that the new veterinary supply table will satisfy the expectations of every veterinarian, in the face of the widely different wishes submitted by them. To the twenty-six circular letters sent out by the Board twenty replies were received, and some of them showed deep interest and hard study. A few replies were very brief and one of our oldest members left the whole matter "to the intelligence of the board," and we hope that we shall not disappoint him. But, however this may all be, it is sure that if the recommendations of the Board are approved in their entirety, a great step forward will have been taken in supplying the means for an improved army veterinary practice.

OLAF SCHWARZKOPF.

ARMY VETERINARY NOTES.

A board, composed of Veterinarians Robert J. Foster, Twelfth Cavalry, and Robert C. Musser, Fourteenth Cavalry, and Mr. Edward P. O'Connell, Veterinarian, Quartermaster's Department, is appointed to meet at Manila December 2 to consider and report as to success of treatment for surra and the practicability of transporting officers' mounts from the Philippine Islands to the United States without danger of carrying infection and what quarantine measures to prevent same can or should be taken at this port. S. O. 281, December 1, Philippine Division.

Veterinarians Charles H. Jewell, Sixth Field Artillery, and John H. Gould, Eleventh Cavalry, have been detailed by the War Department to attend the annual meeting of the American Veterinary Medical Association at Toronto, Canada, August 22-25, 1911.

O. S.

CORRESPONDENCE.

New York, U. S. A., February 10, 1911.

Editors AMERICAN VETERINARY REVIEW, New York, N. Y.

We notice on page 673 of your February issue an article by Dr. Wm. P. Hill, of the First Field Artillery, stationed in the Philippine Islands, descriptive of the use of "Peroxide in Pneumonia." In this article the gentleman states he tried "Nuclein, Tallianine, Stimulants, etc., etc." with an expected fatal termination, when he tried peroxide, and the case terminated as he expected.

It is well known that "Tallianine" is guaranteed for one year only, and equally well known that we accept return of this product in original containers and replace the returned goods with fresh stock without expense to the purchaser other than for transportation charges. No Tallianine has been sent to the Philippines since 1907 owing to the difficulty in securing cold storage for it while en route and in stock there, so it is fair to presume that if Tallianine were used in this case the injections were useless only because the active principle of the product was exhausted. Of course returns from the Philippines are impracticable owing to the distance from our home office which will explain why we have not asked veterinarians stationed there to use Tallianine; but we hope some day to arrange matters with the Quartermaster General of the Army permitting its transportation in cold storage and similar storage while in stock there. In this case Tallianine will be effective for a practically indefinite period as a low temperature will preserve its properties while a prolonged high temperature will destroy them. Added to this and as explained in all our printed matter, stimulants of any kind, and particularly alcohol, should be avoided in connection with the use of Tallianine for reasons which must be apparent to every member of the profession when the character and properties of this product are considered.

Respectfully yours,

WALTER F. SYKES & Co.

OBITUARY.

T. BENTON COTTON, V.S.

Dr. T. Bent Cotton, as he was familiarly known, died at his home in Mt. Vernon, Ohio, January 6th, in his seventieth year, following an acute illness of but three days' duration. Dr. Cotton had been in frail health for several years past, but was able to be about his premises, where he devoted considerable of his time to gardening, which he found a congenial pastime. All things in nature appealed to his big lovable nature, and the final summons found him among his birds and chickens, which he fed with loving hands, referring to them tenderly as his "boarders." One of the most beautiful sides to his life was the domestic side, where his thoughtful solicitation for the comfort and happiness of the members of his family was a constant feature. Dr. Cotton was a son of the late Hon. Emmett W. Cotton, and was born in Mt. Vernon on March 21, 1841. In 1862 he enlisted in the Twenty-sixth O. V. I. and went into camp at Delaware, Ohio. Upon arriving at Columbus he was appointed recruiting agent, with commission of second lieutenant. Afterwards he assisted in recruiting a company and was assigned to the One Hundred and Twenty-first O. V. I., serving as second lieutenant until 1863.



when he received wounds at Perrysville, Ky., that disabled him. Following his discharge, he returned to his birthplace, where in the early 70's he took up the study of veterinary medicine. He was graduated from the Ontario Veterinary College in 1882. Dr. Cotton was a member of the American Veterinary Medical Association and of the Ohio State Veterinary Medical Association, and was elected honorary member of the latter organization in January, 1910. The last meeting of the A. V. M. A. that the doctor attended was at Philadelphia in 1908.

He was one of the first agents of the Knox County (Ohio) Humane Society, which was organized in 1884, and was active in it up to the time of his death. He was also a member of the Poultry Fanciers' Association and an enthusiastic member of the Grand Army of the Republic, and served as commander of Joe Hooker Post No. 21 in 1899.

Dr. Cotton is survived by his wife and Miss Anna Bell Cotton, an adopted daughter.

GREAT is the American draft horse, mighty in war or in peace, more powerful on the farm and the most important factor in commercial interests, to keep the wheels of industry going to load and unload hundreds and thousands of trainloads every day. Take the draft horse out of the cities and it would bankrupt the nation, and the railroad freight trains would stand idle on the side tracks.—*Live Stock Journal*.

THE annual banquet of the New York American Veterinary College will be held at Reisenweber's, Fifty-eighth street and Eighth avenue, on Wednesday evening, April 26th. A large gathering of the graduates from the two oldest institutions for veterinary education in America (whose amalgamation formed the present school) is anticipated. President MacKellar called a preliminary meeting on February 16th for the purpose of appointing a dinner committee and making other necessary arrangements. This early assembling of his forces on the part of the president, and the enthusiasm manifested by Secretary Carey, foretells an even more successful affair than that of last year, which was the best in many years. Each member will receive a communication from the secretary in the near future, advising him of the hour of the meeting of the association on the day of the dinner.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

DIABETES MELLITUS IN A DOG [*R. Watts, Student*].—Cross-bred Welsh terrier had a fractured skull, having been kicked by a pony. The frontal bone was driven in and had to be raised, as it pressed on the brain. For three days the dog was delirious, howled repeatedly and kept moving, turning round in a circle from left to right. When the delirium stage had passed, the dog only seemed to understand that his food was to eat and his water to drink. Tonics and thyroid tablets were given. Recovery was partial, as the dog acted queerly afterwards. He has been treated since for eczema, otitis or worms, but in none of these occasions did he seem to show any ill effects of his fracture. Then his hair began to fall off; he became lame on the left foreleg and was then reported drinking excessively and eating all he would get. He became bald on the forehead and under his body, while the hairs of his back became patchy and thin. The case was diagnosed as one of diabetes mellitus, resulting from the kick and fracture. The dog finally had fits and was destroyed. No post mortem was allowed.—(*Vet. Record.*)

CHYLOUS ASCITIS IN A CAT [*Messrs. Smythe and Smythe, M.R.C.V.S.*].—Fine Persian cat, great hunter and feeding on his hunts, viz., raw wild rabbits. He shows the ordinary symptoms of ascitis, but no other signs of illness, except a large abdomen and from it difficulty in breathing. Paracentesis abdominalis is performed. Four pints of fluid are extracted. It has the appearance of pure milk. After the operation, no new growth or anything abnormal is detected on palpation of the abdomen. Great improvement follows and after getting 2 grains of calomel, the cat is sent home. However, after seven weeks, another operation was necessary as the abdomen has again grown large. One pint of same characteristic fluid is taken off. The cat went home again and has shown no falling off in condition. The

fluid was evidently chylous in nature. For treatment, milk and all fatty foods were taken off his diet.—(*Veter. News.*)

TABES DORSALIS [*By the same*].—The case presented a series of symptoms resembling much those observed in man. Three-year-old dog was said to have rheumatism. The skin is hypersensitive and the dog howls with pains principally at night. At times he looks healthy, but again shows knuckling over suddenly on one or the other of the carpal joints. Later, these knuckles were so severe that the dog would fall. Salts of potassium, iodide and bromide with aperients gave no change. Then great inco-ordination of movement came. The forepaws were lifted high in walking and set down with force. Sense of distance was about absent and in mounting a step, the dog was unable to judge the height or position. He had ataxy with rolling motions while walking. Then complete paralysis set in and the dog was destroyed. He had had distemper when a pup, but had no chorea or twitching contractions left. No post mortem was allowed.—(*Vet. News.*)

ADRENALINE IN LAMINITIS [*Capt. A. J. Williams, F.R.C.V.S., A.V.C.*].—This is the record of two horses, which had laminitis and in which the result was not as satisfactory as anticipated by the records of others. The first horse was under treatment from September 1st to September 30th, during which he had two relapses, after slight improvement, and was finally sold. The second, after about twelve days of treatment, was considered incurable and destroyed.

The author remarks: “Case No. 1 showed no improvement until the morning after adrenaline had been injected; the second injection was followed two hours after by a far worse condition and then by marked improvement. Another relapse took place and injection of adrenaline was followed by improvement the next morning. Case No. 2 was very bad from the start and it was astonishing to see how he had improved some twenty minutes after the injection, being able to trot after an hour. This did not last. Three other injections had no effect afterwards.”—(*Veter. Journ.*)

FOREIGN BODY IN THE PALATE [*George D. Martin, M.R.C.V.S.*].—History of two cases which are very similar. Both have occurred in dogs and in both consisted in splinters of wood im-

bedded in the hard palate, close to the last molar tooth. In both cases there was more or less difficulty in opening the mouth. It was necessary to chloroform the animals to control them, to make a perfect examination and to operate on them. The splinters of wood were extracted with nippers. In one it measured 1 inch in length and $\frac{1}{8}$ in thickness. In the other there were two pieces, the halves of a round piece of dead wood, $2\frac{1}{2}$ inches long by $\frac{1}{2}$ inch thick. The hemorrhage was trifling in both and recovery uneventful after a few days.—(*Veter. Journ.*)

CASTOR OIL POISONING [*Frank Chambers, M.R.C.V.S.*].—This occurred in South Africa where piroplasma parvum are in abundance and an outbreak being reported; the author was called to see to it. Twelve cattle were dead and nine remaining ill. The farmer to keep the cattle free from ticks had smeared them with equal parts of castor oil and antifriction grease. Nothing happened for several weeks until one cow died and after a few days others became sick and twelve died in rapid succession. The post mortems did not reveal any of the lesions of East Coast fever, but all had inflamed patches of the rumen and abomasum. The lungs, liver and kidneys were normal. As the cattle had been smeared once a week and had naturally licked themselves, as they ordinarily do, it is evident that they absorbed a large quantity of castor oil which in time produced ill effects. The remaining of the herd, more or less sick, had their legs tremendously swollen, the dewlaps dropsical and great difficulty in moving, their joints being blistered and cracked. They had also diarrhoea. Simply opiate treatment and washing away the applications on the skin formed the base of the treatment.—(*Veter. Journ.*)

DEGIVE'S OPERATION IN UMBILICAL HERNIA—DEATH [*E. Wallis Hoare, F.R.C.V.S.*].—Filly has a not very large hernia, although the hernal opening is rather wide. She is operated by Degive's method, does well for ten days, and then gets off her food. The temperature rises to 106° F. Diarrhoea sets in and as the case gets in hopeless condition, the animal is destroyed. At post mortem lesions of septic peritonitis were present and also a minute opening in the cæcum, which was adherent to the hernal ring.—(*Ibidem.*)

"MAD" STAGGERS [*By the same*].—Five-year-old mare is observed being in pains, lays down, rolls and has unsteady gait.

Spirits ether nit. is given. She becomes violent, rushes about the stall, falls down helpless, struggles with all four, rushes against the wall and inflicts to her forehead a deep wound. Previous to being seen by the author she had one ounce of chloral hydrate given to her in oil. It is very difficult to approach the mare, her pupils are largely dilated, the pulse is full and quick. Aloes, calomel and croton oil were prescribed. The symptoms gradually subsided and the mare became quiet, all evidence of excitement passed off.—(*Veter. Journ.*)

PIGEON CASE [*George W. Wooldridge, F.R.C.V.S., -N.S.*].—This bird somewhere or another had swallowed a pin or a needle. He was brought to the author, who found it protruding from the middle of the back. It was easily pulled out with forceps. No bad effects resulted.—(*Ibidem.*)

VARICOCELE IN DOG [*E. Wallis Hoare, F.R.C.V.S.*].—Fox hound had a long scrotum and on that account the testicles were constantly getting injured while hunting. The cords are unusually long and thick, small pulsations are felt, the testicles hanging very low are smaller than normal. The dog is castrated. Eucaine and adrenaline are used. Both cords had the spermatic veins enormously enlarged and varicous. The artery was larger than normal. Both vessels were ligated and the testicles removed with a portion of the cord. Secondary hemorrhage from a dilated vessel on the edge of the scrotal wound took place and was arrested by ligature. Good recovery followed.—(*Veter. Journ.*)

NOTES ON NUCLEIN IN DOG'S DISTEMPER [*James Peddie, F.R.C.V.S.*].—The author gives a minute record of several cases of distemper among many that he has treated and where with other drugs varying according to the symptoms and the condition of his patients, he has extensively used nuclein and obtained excellent results. Indeed, he says, among his conclusions: "I have in all treated thirty-two cases of distemper with the aid of nuclein solution (veterinary) and have only four deaths, a percentage of recoveries which I could not have hoped for with the treatment previously adopted.—(*Ibidem.*)

LORDOSIS (HOLLOWBACK) IN THE HORSE [*F. C. Mahon, M.R.C.V.S.*].—This is the illustrated record of a twenty-two-

year-old horse, which was worked slightly up to the time when for humanity's sake he was destroyed. The history was that until within the last year of his life the marked concavity of the vertebral column was not so pronounced as to attract attention. In early life the horse had worked in a fire brigade and for ten years after did the ordinary work of a job master. A few months before his death he was occasionally pulling a manure cart. The decreasing muscular power had become well marked and his back would give away under the slightest weight put on it. The concavity of the vertebral column was measured by taking a line from the summit of the withers back to the angle of the croup and the line drawn downwards from the centre of the horizontal line, showed the extraordinary measurement of 8 inches, a measure that deserves to be registered.—(*Veter. Record.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

LARGE SIZE CALF CAUSES DISTOKIA IN A PRIMIPARA [*Pierre Bitard*].—Four-year-old pregnant cow is 35 days behind her time to deliver. In good health up to her seventh month of gestation, she gradually becomes sick, loses flesh, refused eating and her abdomen has grown enormously large. Constantly lying down, she has tympanitis and by violent efforts she expels feces covered with false membranes. Her condition is very bad and an unfavorable prognosis is given. Still vaginal exploration reveals that the neck of the uterus is largely dilated and some of the membranes are protruding through it. But the animal is in such condition that she can make no efforts to expel her calf, which is found in anterior presentation and right cephalo-iliac position with one foreleg under the chest and the other passed backwards over the neck. Notwithstanding careful manipulations the extraction of the foetus is found impossible on account of its enormous size; and taking into consideration the condition of the cow it is thought better to have her slaughtered. The following were the measures obtained of the foetus after its removal from the uterus: Length from the forehead to the base of the tail, 1 meter 44 centimeters; circumference round the chest, 1.02 meter; round the body in front of the stifles, 1.12

meters. The calf weighed 97 kilogrammes. It was a record in its size, says the author.—(*Prog. Veter.*)

MULTIPLE SEBACEOUS HAIR CYSTS IN A HORSE [Dr. Morel].—Making an inspection at the Hippophagic abattoir, the author had his attention called to a round tumor as big as the fist, situated at the base of the neck of a horse, near the anterior border of the scapula and closely adherent to the tissues underneath. It had a semi-solid consistency. In opening it, there was an escape of great many little greyish balls resembling very much small lead shots. They were formed of sebaceous matter, were easily crushed, soluble in ether, xytol and toluene. There were also numerous hairs of various color, measuring 6 centimeters in length. The walls of the cavity was formed by a very thin membrane, grey-white in color and arranged in folds. Besides this cyst, there was another fluctuating pouch, smaller and filled with hairs and sebaceous matter. A third one even smaller had the same contents. These collections were evidently dermoid sebaceous hair cysts. Under the microscope the cystic membrane presented all the characters of the dermis.—(*Bullet. de la Soc. Cent.*)

A FALL, A BRUISE, A SPLIT AND A FRACTURED BONE—HEMORRHAGE [Mr. Sourrel, Army Veterinarian].—Five-year-old Anglo-Arab horse gets loose from his stall, starts at full gallop, slips and falls on the left side. When he gets up, he is very lame on the left hind leg. Careful examination, by palpation, auscultation, rectal examination reveal nothing, and as there is no deformation or swelling anywhere, a diagnosis of severe bruise is made and rest with fomentations are prescribed. Another examination is again negative, although the possibility of a fracture is entertained. Thirteen days after the accident, in the morning, a fracture of the ischium is manifest by the depression of the point of the left hip. The animal is placed in slings. The following day, in the afternoon, he suddenly hangs in the slings and dies as these are taken down. He is lowered down and post mortem is made. When it was found that there was a hemorrhage filling the pelvic cavity, with a fracture of the ischium from the ilium and from the pubis, fracture of the ilium above the cotyloid cavity, separation of the sacrum from the ilium and nine large splinters of bone from the ischio-ilial fracture.—(*Rev. Gener. de Mec. Veter.*)

GEMELLAR GESTATION—DROPSY OF THE ALLANTOID [*Pierre Bitard*].—Record of a case of parturition in which a cow, being fifteen days behind her normal epoch for delivery, became very sick and presented among numerous symptoms accusing her distressing condition, an enormous abdomen, giving rise to serious organic disturbances of the organs of the two great splanchnic cavities. A vaginal examination made with much difficulty permitted the detection of two foetuses. The membranes that surrounded them were very large and although they were incised, but little fluid was allowed to escape. The cow could not be delivered and died the next day. At the opening of the cadaver about one hundred litres at least of fluid escaped from the allantoid cavity, and the two foetuses, one male and one female, were extracted. The first weighed 51 kilogrammes and the other 48. They both were well developed.—(*Prog. Veter.*)

LINGUAL TUBERCULOSIS [*P. Chausse, Sanitary Veterinary Inspector*].—This localization of tuberculosis is rather rare and but few cases are recorded either in French or German literature. The author has lately observed another case obtained from a four-year-old steer, in fair condition, but affected with extensive thoracic tuberculosis; the bronchia, trachea, tongue and digestive canal were also the seat of secondary infection. The case was a typical one of open tuberculosis. The lingual lesions were peculiar. The tongue had ulcerations and sub-mucous lesions. There were two ulcers, one on the left superior border of the tongue, oval in shape, with irregular edges, and on being incised showing superficial caseous nodules. The other ulcer was smaller and situated on the right lateral face of the organ. The sub-mucous lesions had a round form and when cut into showed a muscular tissue partly caseous. It is probable that these lesions were due to injuries of the tongue, where they form true centers of inoculation for the virulent products of the bronchia and pharynx.

The differential diagnosis between this condition of the tongue and that presented in actinobacillosis and actinomycosis can generally be made out by macroscopic examination, but in cases of doubt the histological and bacteriological characters will readily settle the question.—(*Rev. Gener. Medec. Veter.*)

ACCIDENTAL SECTION OF THE EXTENSOR TENDON OF THE PHALANGES—RECOVERY [*Drs. Huguier and Floriot, Army Veter-*

*erinarians].—Returning to camp, passing through a field of grass, two horses suddenly dropped down, throwing their riders off the saddle. When up, the horses were found very lame and with a deep clean wound on the hind legs. One recovered very rapidly, but the other had a rather complicated ending. With him the wound was right across the leg, and involved the anterior part of the left hind cannon. There was an abundant hemorrhage, and a clean and complete section of the anterior extensor of the phalanges found. The wound was dressed antiseptically, sublimate, peroxide, boric acid and finally the wound granulated with such rapidity and life that caustics had to be resorted to to control it. Notwithstanding, a large fibroma developed itself and in a short time became as big as a child's head. The horse was cast, and the fibrous neoplasm removed. It was hard, lardaceous and when once it is off the tendon of the anterior extensor of the phalanges was found *entirely destroyed*, with its sound part remaining firmly adherent to the superior third of the cannon bone by several adhesions. The wound, however, cicatrized normally, and the horse was soon able to resume his work. The perfect action of the leg was kept up by the lateral extensor of the phalanges which had united to the remaining healthy portion of its congener.—(Recueil de Medec. Veter.)*

ULCEROUS ENTERITIS OF UNKNOWN CAUSE [MM. Guerrnau, Dignac and Chinon, Army Veterinarians].—Biche was a mare, aged 17, which was laid up on account of her extreme emaciation. This condition was attributed to overwork and insufficient food. Good hygiene and plenty of building-up food did not improve her. Yet, she presents no special symptoms, except loss of appetite and flesh. Auscultation reveals nothing on the respiration. Circulation is normal. Defecation is natural, there is no fever and rectal examination is negative. Later, however, she has polyuria without sugar or albumine. Soon foetid diarrhoea takes place. Suddenly the temperature rises 39° C- 39.5° C. Slight colics occur and the mare dies.

Post mortem revealed: Suppurative peritonitis, ten litres of sero-purulent fluid, peritoneum covered with exudates and congested. The intestinal lesions are extensive on the small intestines, cæcum and cæcal portion of the colon. In some places, there are nodosities varying in size from that of the head of a pin to that of a large bean. There were the first stage of the ulcerations. Those are small, irregular and some are looking like

chancres, principally those of the small intestines. In some places the ulcerations are running through the intestinal walls, which are necrosed. The other organs showed no specific condition. This ulcerous enteritis resembled by its termination form of the typhoid fever of man.—(*Bullet. Soc. Centr.*)

BELGIAN REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

CARDIAC PALPITATIONS IN A HORSE [*C. Verlinde*].—Seven-year-old heavy draught horse has done its work well, when one day he refuses his food. He stands in his stall, with the contractions of his heart so violent that the whole body is shaking. They are between 76 and 80 to a minute. Respiration is about normal. Temperature 40.6° C. Pericarditis is suspected. Mustard is applied to the chest. Electuaries of digitalis and cinchona are prescribed. In the afternoon the condition is worse. The heart beats are such that they can be heard several yards away. The chest and flanks are shaking and the neck, croup and thighs are also. The shocks are between 84 and 88 to the minute, yet the respiration is about normal. At auscultation a dull sound is heard, covering those of the heart. The pulse is small, weak. Temperature lower, 39.4° C. Citrate of caffeine and benzoate of soda in distilled water are injected subcutaneously. Towards evening, condition is better. Cardiac beats are down to 70 and temperature 39° C. The pulse is stronger and the artery fuller. A little more caffeine is given. The next day the improvement continues, but the horse is very excitable. One more dose of caffeine. No more bad manifestations are observed; the horse is returned to work a few days after.—(*Bull. Med. Vet. Prat. Malines.*)

TWO CASES OF CHRONIC TETANUS—RECOVERY [*By the Same*].—Concise records of two cases where all the symptoms were well manifested, and in which the treatment was for both about the same. It consisted in quietness, in dark stall, subcutaneous injections morning and evening of 10 centigrammes of pilocarpine, 100 grammes of chloral in enemas three times a day. Diuretics and good heavy blanketing were used. In one horse the pilocarpine was not given, but towards the end anti-

tetanic serum was used twice a day for six days. Both cases had severe manifestations which subsided by degrees, after a duration of 8 or 10 days. Recovery was perfect in both. The last case had a severe attack of tympanitis by over-feeding from which pilocarpine relieved him in quick order.—(*Ibidem.*)

MORPHIA AND OPIUM IN OUR DOMESTIC ANIMALS [*Prof. A Vanden Eeckhout*].—At one of the meetings of the Veter. Society of Belgium, the author delivered a long lecture on the subject, where in considering the general effects of these drugs, and relating some of his experiments, he resumed his article in saying that "morphia had in all animals a specific action on the brain; in some it produces sleep, in others on the contrary excitement and a kind of drunkenness. In all it seems to promote a sensation of comfort and removing unpleasant sensations; it is not a central anaesthetic as chloroform; in all animals that it puts to sleep, it abolishes greatly the sensibility to such an extent that often acute pain, by the use of the bistoury is well supported. On the contrary in those that it does not produce sleep, the feelings of painful excitation is not abolished."

In relating the therapeutic uses of morphia in veterinary medicine, the author writes: "For dogs it is indicated as hypnotic, as reducing pains, quieting respiration, as constipating and as a sedative of the intestines, as it is in man.

In cats, it is indicated in small doses to promote constipation.

In horses it may be used sometimes with success to subjugate vicious animals. It quiets cough, promotes constipation, and acts as a sedative in intestinal troubles. It is contra-indicated in most cases of colics; those by indigestion, by constipation, volvulus, wind colics, etc., etc., in all those cases the agents that produce bowel evacuation are indicated. It must not be used to obtain hypnotic or analytic effects, nor as a local anaesthetic.—(*Annal, de Bruxelles.*)

TUBERCULOUS PERITONITIS WITH ASCITIS IN A HORSE [*Charles Eyvaert*].—Fourteen-year-old mare has an enormous belly. She aborted three months ago of a dead foetus, but yet her abdomen remained large. She is in fair condition. The pulse is small and hard, the conjunctivæ congested, no swelling under the chest, nor on the extremities. The temperature is 38.5° C., respiration accelerated. Auscultation and percussion are negative. The flanks are hollow. Perimeter of the abdomen

in front of the hips is bigger than around the girth. Vaginal examination shows the absence of pyometry and hydrometry. Rectal examination feels the floating motions of the liquid mass by pressure on the intestines. Dropsy of the peritoneum is diagnosed and a treatment by purgatives and diuretics prescribed. No result is obtained and the owner declines a puncture of the abdomen. The cow goes to the slaughter house. In opening the abdomen 225 litres of clear, yellowish fluid were removed. There were only extensive lesions of miliary tuberculosis involving the layers of the peritoneum. All the other organs were free from disease.—(*Ibidem.*)

DR. A. H. LEGENHAUSEN, Jackson, Minn., in renewing his subscription to the REVIEW, says: "Of course it is useless to say that the REVIEW is the staff of the veterinarian; and the only thing I regret is that it does not appear oftener."

THE second story of the anatomical wing of the New York State Veterinary College is nearing completion. This will double the capacity in the anatomical department and in addition will give an enlarged lecture room.

DR. H. J. JOHNSTON has gone from Kenora, Ont., to Forward, Sask., Canada. In renewing his subscription to the REVIEW, the doctor takes occasion to say: "I consider it of more value than my text books, therefore could not get along without it."

AT the election of officers to the Salem (Oregon) Humane Society on January 31st, Dr. D. D. Keeler was elected president. President Keeler suggested to the organization that premiums be offered for the best kept horses in the city, thereby stimulating an interest among grocerymen, draymen and others to devote especial care to their horses.

PROF. V. A. MOORE, Director of the New York State Veterinary College, addressed the "New York Farmers" at the Metropolitan Club on Tuesday evening, February 20th. The address took the form of a popular talk, discussing the reasons for so many tubercle bacilli as reported in city milk, and touching briefly on the methods for the control of bovine tuberculosis. It is not possible to estimate the great amount of good that results from talks of that kind.

SOCIETY MEETINGS.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held at the Augusta House, Augusta, January 12th, at 4 p. m., with President Joly in the chair. The following members answered to the roll call: Drs. Westcott, McGillicuddy, Salley, Watson, Joly, F. L. Russell, Lynch, Robinson, F. E. Freeman, Jackson, E. E. Russell, Inglis, West, R. E. Freeman, Darling, Mebane, Purcell, Ness and Blakely.

The minutes of the previous meeting were read and approved.

Drs. Salley, Joly and Blakely reported favorably on the progress by legislative committee.

The application of Dr. J. L. Parks was read and referred to the executive committee.

The treasurer's annual report showed a good balance on the right side of the ledger.

The secretary's report was postponed to the April meeting to allow him to square accounts for coming banquet, etc.

The election of officers for ensuing year resulted as follows: President, Dr. Geo. F. Westcott, of Portland; Vice-President, Dr. Geo. R. Inglis, Auburn; Secretary, Dr. C. W. Watson, Brunswick; Treasurer, Dr. I. L. Salley, Skowhegan.

The president-elect, Dr. Westcott, in a few well chosen words thanked the association and took the chair. During the course of the evening he reappointed the old committee on legislation and appointed an executive committee of Drs. Russell, Lynch and Freeman.

No papers were prepared for this meeting, as the time was short before the banquet.

The president appointed Drs. F. E. Freeman, G. R. Inglis and W. H. Robinson to read papers at the April meeting, and Bangor was selected as place of next meeting.

At 8.30 twenty members and their guests filed into the dining room of the Augusta House and sat down to an excellent supper.

Under the guidance of our genial toastmaster, Dr. A. Joly, the following program was carried out with occasional interruptions by an orchestra of stringed instruments: 1. "To Our State," Dr. B. A. Bailey; 2. "Municipal Meat Inspection," Dr. W. L. West; 3. "Sanitary Milk Inspection," Dr. W. H. Lynch; 4. "Agriculture," Hon. J. P. Buckley (Com. of Agriculture); 5. "Control of Contagious Disease," Dr. I. L. Salley; 6. "The Legislature and the United States," Hon. S. W. Gould, Congressman from this district; 7. "The University of Maine," Dr. F. L. Russell; 8. "The Press," Mr. Smith.

The following invited guests were present: Hon. Samuel W. Gould, Skowhegan; Hon. J. P. Buckley, Commissioner of Agriculture; Dr. B. A. Bailey, Chairman Breeders' Association; Hon. J. P. McIntyre, Hon. J. M. Deering, Hon. F. S. Adams, Mr. Smith, P. D. & Co.; Mr. Brophy (Press).

This was our second banquet and it was a source of pleasure and profit to all and an occasion to be long remembered. Occasions of this kind serve to bind the members closer together and give us something to look forward to each year, striving to make the occasion a little better each time, until each of the members feels that he cannot under any circumstances afford to miss the association meetings and, above all, the annual banquet.

C. L. BLAKELY, Secretary.

ADDRESS DELIVERED BY W. H. LYNCH, D.V.S., AT THE ANNUAL MEETING AND BANQUET OF THE MAINE STATE VETERINARY MEDICAL ASSOCIATION.

Mr. Chairman and Gentlemen—When I was assigned my subject by the worthy president of our association, I demurred at the idea of so comprehensive a subject; but I was overruled and told off for duty just the same as if I had consented. So I will try to obey orders, although I may not achieve as much distinction as Mrs. Pixley's little boy did when she told him to "set" the old turkey hen. "Johnny," said Mrs. Pixley to her small son, "get some eggs and set the old turkey hen." So Johnny obediently set about the job and when he returned to the house, his mother questioned him. "Well, Johnny, did you set the old turkey hen?" "Yes, ma." "How many eggs did you give her, Johnny?" "I gave her a hundred, ma." "A hun-

dred! good gracious! Johnny, whatever did you go and do that for?" "Well, ma, I just wanted to see the old turkey *spread herself.*"

It would seem that the president expected me to spread myself over a very large territory in asking that I should speak on "Sanitary Milk," which would require a very large number of words and a greater length of time than I am allotted if I should go very much into the ramifications of this subject. However, I shall not do this.

Sanitary milk is healthy milk. Milk from healthy cows, that are housed in clean cowhouses—cows that have bodies kept clean by brushing and care—cows that have clean udders emptied into clean pails. The man who milks must be clean and healthy and wear clean garments which should be kept for wear while milking the cows. The milk pails after being filled must be kept away from contaminating odors and surroundings until put in the milkroom where a temperature of not less than 50 deg. F. should be maintained.

We find milk to be primarily "the fluid secreted by the mammary glands of the division of vertebrate animals called mammalia." The milk of various domestic animals is more or less used by man for food. Milk is an opaque white fluid containing fat globules in suspension, albumin, salts in solution, a variety of sugar called lactose that is peculiar to milk, and caseinogen in partial solution. The fat which we separate to make butter and the lactose constitute the carbonaceous portion of milk regarded as food. The casein, which is the principal part of cheese, and a certain proportion of albumin which is present, form the nitrogenous, while the complex saline substances and water are the mineral constituents. These substances are arranged in a proportion which render milk a perfect and typical food for the young of various animals and is provided by nature for them. Milk in either its natural state or in the form of butter and cheese is an article of diet so useful, wholesome and palatable, that dairies are important branches of husbandry. For dairy purposes different countries have different animals, each determining the most suitable animal for their use.

The Laplander gets his milk from his reindeer. The roving Tartar from his mares. The Bedouin of the desert with great ingenuity from his ships of the desert, his camels, the milk producers of which also serve him as cows. In Europe and this country the milk of goats is thought to be of value for young

children. Goats are adapted to the conditions of rocky, mountainous countries where cows would be ill fitted to get about.

The milking of ewes was once a common practice in Great Britain, but has fallen into disuse. In this country with the exception of a few goats the cow is used for dairy purposes.

Cows of every breed from the shorthorn to the typical Texas longhorn—the common native variety—the whitefaced Hereford so popular in the west, the butter specialist, the Alderney; the many imported sorts—Dutch belted cows, Aberdeenshire, Holstein and so on through the various types—are used for dairy purposes. The yield and quality of milk obtained from a cow is much influenced by the food; but a larger field is generally had from a cow that is not aged. When food is given that is deficient in butter, sugar casein and phosphates, the cow will supply these elements from her own system; so that in order to maintain her condition it is necessary that her food contain an adequate supply of the requisites for good milk.

It is becoming better understood among all classes of consumers that one of the greatest menaces to the production of sanitary milk is latent or developed disease in cows. In our state we test for a single disease, out of a fairly large group to which cows are subject, and most of which are directly transmissible or communicable to man.

This is the problem which we are facing. With a high standard of health in addition to clean surroundings, it is evident that we have gone far on the road towards production of sanitary milk. The danger to which children are exposed by drinking raw milk from cows that are not healthy or kept in good condition can hardly be estimated. This danger is lessened by application of heat to milk, thus destroying its pathogenic bacteria. Outbreaks of diphtheria, scarlet and typhoid fever are often traced to the milk supply, and the fatal cholera infantum causing a heavy death rate in children is largely due to the presence of putrefactive germs—tyrotoxicon—in stale milk. There are two methods of subjecting milk to this process, pasteurization and sterilization. Milk that is pasteurized has been raised to a temperature of 150 deg. F. for twenty minutes, this being sufficient to destroy germs of tuberculosis and scarlet fever. Sterilized milk has been raised to 212 deg. F. and kept rather over for some time. This milk when hermetically sealed will keep for an indefinite time; and it may be readily seen that this milk

is better for feeding young children than raw milk about which there is the slightest question.

The drawback to applying heat to milk is that it is rendered less agreeable to taste for persons who have followed the researches of Professor Metchnikoff and learned to admire the taste of sour milk; for this milk will not sour satisfactorily, but becomes "flat, stale and unprofitable." Professor Metchnikoff, you will remember, found a great many centenarians among the Bavarian peasantry, which he accounted for by their habit of using a great deal of sour milk. He concluded that lactic ferments were destroyers of bacteria infesting the large intestines, hence promoters of longevity.

Pasteurization and sterilization while fully capable of destroying the germs of tuberculosis, typhoid and scarlet fever, do not destroy all malefic germs which may work quite as much harm, for stale milk manufactures its own poisons of the ptomaine type—tyrotoxicon—for instance showing that we have not as yet found any perfect means of sterilization. At best, all these processes are makeshifts; hence our only hope of producing sanitary milk must be in highly specialized conditions of inspectorship of its production. It is evident that we can make no effectual substitute for fresh milk, so it becomes incumbent to be practical we turn our efforts and energies in this direction. So we have the expedients of certified milk, standardization, inspectorship of dairies, etc., etc.

In this direction our path is beset with difficulties of co-operation of the producer with the inspector, the former slowly learning to look with friendliness at the latter.

During the past five years 28,859 samples of milk were examined by the Health Department of the District of Columbia with a showing of $23\frac{1}{2}$ per cent. below the standard. There were 1,305 prosecutions for the sale of adulterated milk in the courts, these robberies made up largely of the pennies of poor people, half starved children, amount in money value each year to more than the cost of the Health Department.

Matters there cannot be safely left to individual dealers; but there must be provided a system of supervision and certification coming out of an inspectorship by competent and qualified veterinarians who will not certify milk coming from unhealthy cows or unclean surroundings, but solely clean milk produced by healthy cows. A system of inspectorship that would include the dairy surroundings as well as the cows; that would provide pure

water for the cows to drink, clean cowhouses, healthy animals, would, undoubtedly be a very efficacious solution of the problem of sanitary milk. If the Inspector were coming to take cognizance of the surroundings, there would be an incentive to effort, an emulation to see who could get the highest ratings. In time it would be seen that the inspector was not an enemy but a friend to the dairy man, since incipient disease would be recognized and stamped out to the well-being of the herd. Sanitary conditions and regulations as to water, care of the milkhouses, raise so much higher the rate of health, that a return to the old conditions would be as vigorously negatived by the herd owner as the sanitary commissions. That certified milk should be milk produced at dairies subjected to periodic inspection and frequent analyses.

That it be shown that the cows producing such milk must be properly fed and watered and free of disease; housed in clean stables, properly ventilated, and be kept brushed and clean. Milk drawn under conditions to preclude infection, immediately strained, cooled and put in sterilized bottles and kept at a temperature not to exceed 50 deg. F.

The purity of the water to be determined by bacteriological and chemical examination. Certified milk should not be more than twelve hours old when delivered. I very much doubt if any expedient ever produces for us sanitary milk, short of an inspectorship to be provided.

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION.

President S. C. Neff called the association to order promptly at 10 o'clock in the Assembly Hall, Murphey's Hotel, Richmond, Va., January 13, 1911. The roll call evinced the presence of Drs. Faville, Gilchrist, Willis, Bannister, J. G. Ferneyhough, Neff, Will, Chrisman, Fraser, Epps, Von Lloyd, Barclay, T. H. Wood, Bowers, Holmes, Adair, Sweeny, Fischer and Walters. After reading and adoption of the Minutes, the Board of Censors was called into executive session to pass upon applications for membership. The report from this committee recommended to membership Drs. G. J. O'Brien, Keswick,, Va.; W. G. Black, Norfolk, Va.; R. M. Corey, Richmond, Va., and D. P. Devine, Washington, D. C., who were favorably received. These gentle-

men were elected to membership in the association by a unanimous vote.

PRESIDENT NEFF'S ADDRESS.

The constant aim of this organization should be to establish a professional and social caste for its members, so that the most beneficent relations may be developed between the profession and the public. It is important then, and absolutely necessary that we have the entire and united efforts of every member of the veterinary profession. One dissenting, or inefficient member of this organization may be sufficient to defeat the entire plan. One man failing to co-operate must not only later find that his own usefulness is hindered, but that the work of the profession is thereby seriously, if not entirely crippled. We have much at stake and more will surely arise presently, and in order to meet the varying and important conditions affecting our profession, we need the active and interested work of every member in the association. When the veterinary profession, as a whole, realizes that its successful establishment depends upon the success of every member of that profession, then and not until then, can we hope to obtain the first requirements for success, complete and perfect organization. This is not only true of the profession as a whole, but equally true of the individual veterinarian, whose success often depends on the success of an associated, or neighboring, practitioner, one to assist in the development of that caste that is so essential to a successful dealing with the public. A weak, inefficient member of the profession is a distinct detriment, inasmuch as we are more often judged by our failures than by our successes. The states are awakening to the importance of the veterinary profession and when the time comes for us to exercise the trust that surely must be imposed upon us, let the profession be found entirely competent.

Now a few words in regard to the criticism of our competitor and the laity. A fair amount of criticism is due and expected and should prove beneficial. However, a proper understanding of the circumstances is absolutely essential and a true regard for the truth is imperative. It is human nature to interest ourselves in the doings of our neighbor, to a certain extent. To talk of the petty affairs, personalities, trifling misunderstandings, often generated by meddling tongues, are at best very unimproving and serve to kindle the spirit of intolerance, one of the oldest and one of the most baneful habits of the human mind.

When thus criticized, pick up the stones hurled at you and build for yourself monuments.

The first other address was that of Dr. W. B. Niles, of Ames, Ia., who has charge of the United States Experimental Work of the production of Hog Cholera Serum upon a farm located near Ames. Dr. Niles rehearsed a good portion of the work at Ames, giving the mode of preparation of serum and the work that has been done by the Government in manufacturing and working out the efficiency of Hog Cholera Serum. This was a most excellent address. He held the attention of the entire audience for over an hour. A general discussion was entered into immediately after Dr. Niles interesting address. It is needless to say that all the members present propounded many questions to Dr. Niles and received very satisfactory answers. Dr. Niles was with us to fill the place on the program made vacant by the absence of Dr. Melvin who asked the privilege of sending a representative if he found it impossible to be present.

The next feature of the program was the address of Dr. Roy K. Flannigan, State Health Inspector, on the subject of "Some Points of Contact Between the Veterinarian and the Public Health." This was a very strong and able address and Dr. Flannigan acquitted himself with honor. In fact, so well pleased were the members of the Association that they elected him to honorary membership before we even adjourned for lunch.

Dr. J. G. Ferneyhough gave a splendid address on the subject of "The Official Relation of a State Veterinarian to the Practitioner of Veterinary Science." Dr. Ferneyhough, in his usually agreeable manner, defined very clearly the relation which should exist between such parties. I think everyone agreed that Dr. Ferneyhough handled his subject ably.

It was a source of great disappointment to the members of the association not to have with us Dr. E. P. Wood and Hon. W. D. Saunders, both of whom had places on the program but were forced to be absent on account of illness.

After the completion of the literary portion of the program we entered upon new business for a few minutes. Dr. Chrisman introduced a resolution placing members of the association who had been active and faithful for twenty years on the honorary roll, which carries with it the non-payment of dues. After some discussion it met with a second, and the resolution was

adopted. At present we have members who have been active and faithful for seventeen years and if they continue three more years, it will certainly be an honor and pleasure to see these men pass to this roll which will indicate their faithful service of twenty long years. On motion of Dr. Faville, Dr. W. B. Niles was elected to honorary membership. On motion of Dr. Chrisman, who spoke of the esteem in which the association holds Dr. E. P. Niles, a former officer and one of the pioneers in the organization of this association, he was placed on the honorary roll.

The election of officers was the next item of business which resulted as follows:

President, Dr. J. G. Ferneyhough.

First Vice-President, Dr. H. Bannister.

Second Vice-President, Dr. Chas. Epps.

Secretary and Treasurer, Dr. W. G. Chrisman.

The newly elected president then appointed the Board of Censors which is composed of Drs. Willis, T. H. Wood, J. H. Sweeney, Adair and Holmes. The date and place for the next meeting was decided to be the Lynhaven Hotel, Norfolk, Va., the second Friday in July.

The Association then adjourned to meet in the dining room where Colonel Murphey had prepared for us a splendid dinner.

W. G. CHRISMAN, *Secretary-Treasurer,*
Raleigh, N. C.

COLORADO VETERINARY MEDICAL ASSOCIATION.

The annual meeting of this association was held in the Gentlemen's Riding and Driving Club rooms, Denver, Colorado, January 20, 1911.

The members in the forenoon visited a pathological exhibit given at the packing houses for the Meat Inspection Class of the Division of Veterinary Science, State College.

The meeting was called to order by the President, Robert H. Bird.

The secretary read a letter from Dr. M. H. Reynolds, secretary of the International Commission on the Control of Tuberculosis, offering copies of the reports on payment of the express charges. This offer was accepted by a motion.

The following new members were then admitted: Drs. W. W. Stewart, E. H. Aicher, F. D. Hylton, A. G. Wadleigh, G. McClain, J. C. Pace, C. Schaefer, W. S. Craig, G. C. Shaw, N. J. Miller, and E. A. Myers.

The matter of prosecuting offenders of the veterinary practice act was up and discussed. By a motion the prosecuting committee was ordered to proceed at once with prosecutions.

The subject of needed sanitary laws for the State of Colorado was up and discussed. Dr. E. J. Foreman read the Illinois law on the control and eradication of contagious diseases and urged the association to draft a bill and present it at the present legislature. It was moved by Dr. I. E. Newsom that it is the sense of the association that the legislative committee draft a bill along the lines suggested by Dr. Foreman and present it to the Live Stock Inspection Board and the several Live Stock Associations for their approval and support. Carried.

Dr. W. W. Yard, secretary of the State Examining Board, read a report and also an opinion of Attorney General Barnett on the authority of the Examining Board to prosecutions of violators of the law. Moved, seconded and carried that the members of the Examining Board and Legislative Committee be instructed to see what legal authority they deem necessary and to propose whatever amendments to the present law thought advisable, to the present legislature.

A resolution was passed asking the legislature to allow the appropriation asked for by the Veterinary Section of the Experiment Station for the purpose of conducting investigations in contagious diseases of animals in the State of Colorado.

The following resolution was then passed:

WHEREAS, Many of the diseases of the domestic animals are known to be transmissible to human beings, and,

Whereas, The transmission of these diseases may be through the medium of foods as meat and milk, etc., is well recognized, and,

Whereas, The State Board of Health has not a representative that is competent of the recognition of the presence of these diseases in the lower animals, therefore, be it

RESOLVED, That we, the Colorado Veterinary Medical Association, in session, recommend to the Hon. John Shafroth, Governor, that he appoint a licensed graduate veterinarian on the State Board of Health.

The following proposal for an amendment to the constitution and by-laws was read:

ART. III. Shall be changed to read that the officers of this association shall be a President, First and Second Vice-Presidents, Secretary-Treasurer and an Executive Committee, all of whom shall be elected by ballot at each semi-annual meeting, they to assume their duties following the next annual meeting.

CHAS. G. LAMB,
GEO. H. GLOVER,
B. F. KAUPP.

Dr. Geo. H. Glover extended an invitation to the association to hold its next meeting at the State College. This invitation was accepted by motion. It was decided that the June meeting should be a two-days' meeting.

The following officers were elected for the coming year:

Dr. Geo. W. Dickey, President.

Dr. E. J. Foreman, First Vice-President.

Dr. M. J. Woodliffe, Second Vice-President.

Dr. B. F. Kaupp, Secretary-Treasurer.

Executive Committee—Drs. A. B. McCapes, E. J. Foreman and I. E. Newsom.

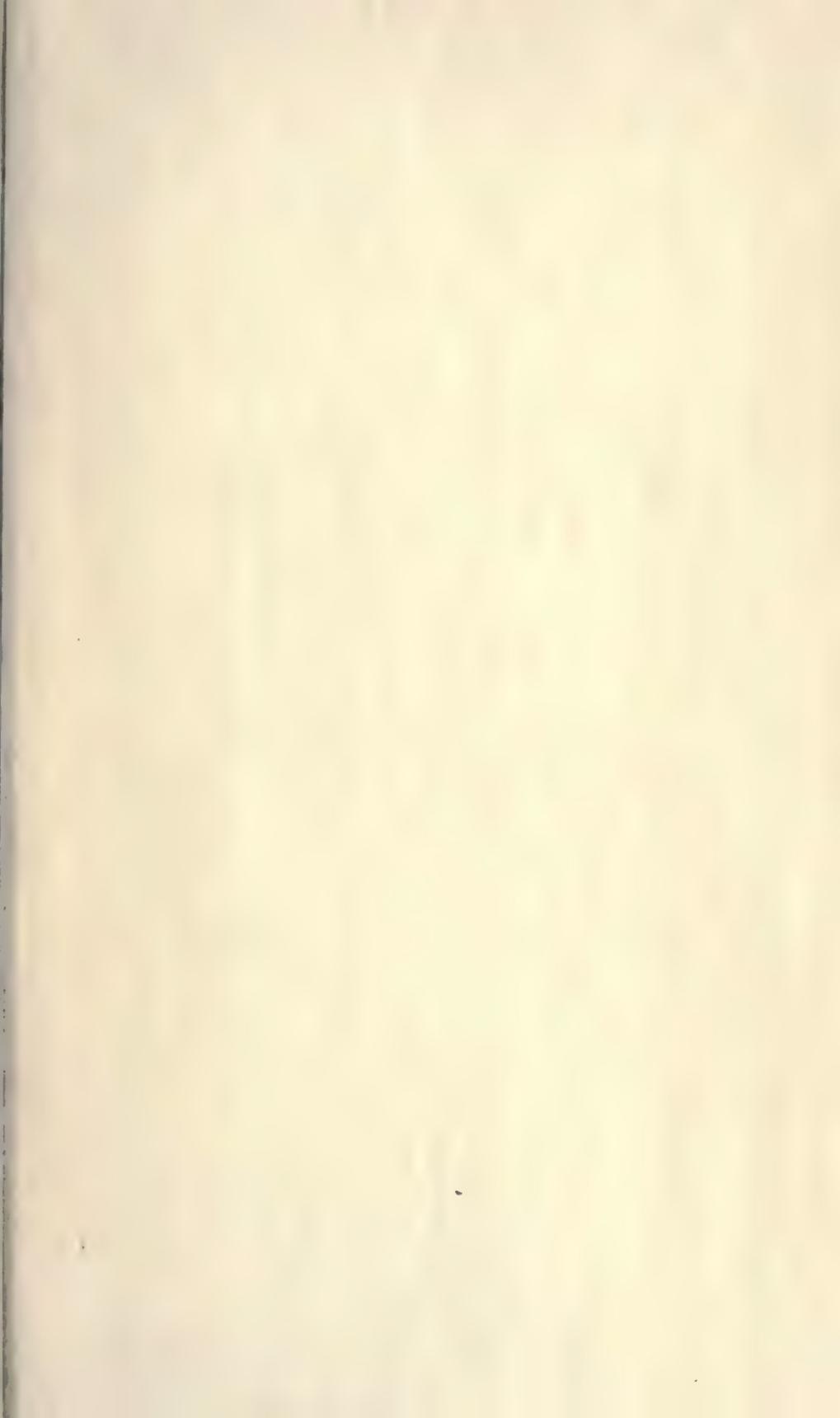
The annual banquet was held at the Auditorium Hotel.

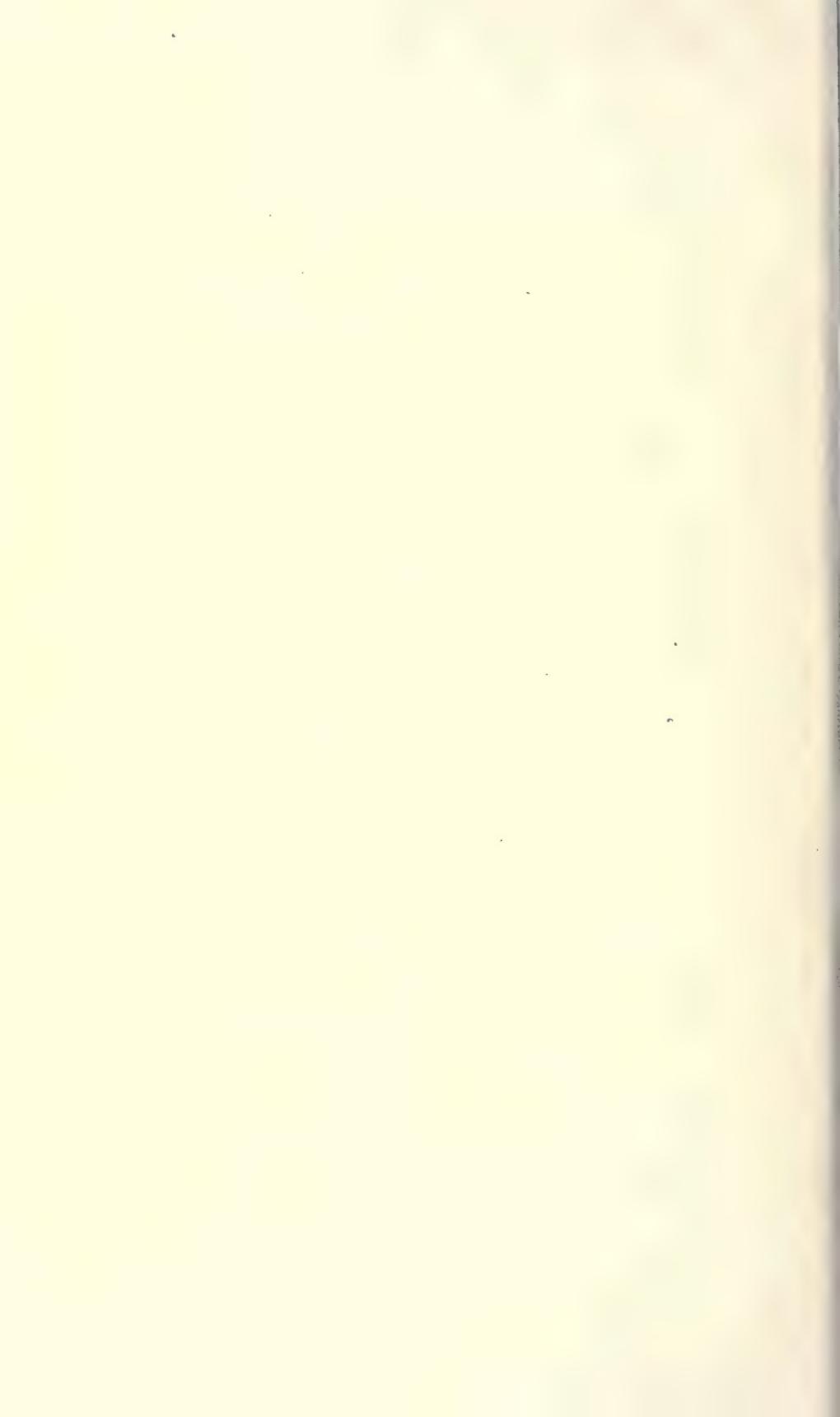
M. J. WOODLIFFE, Secretary.

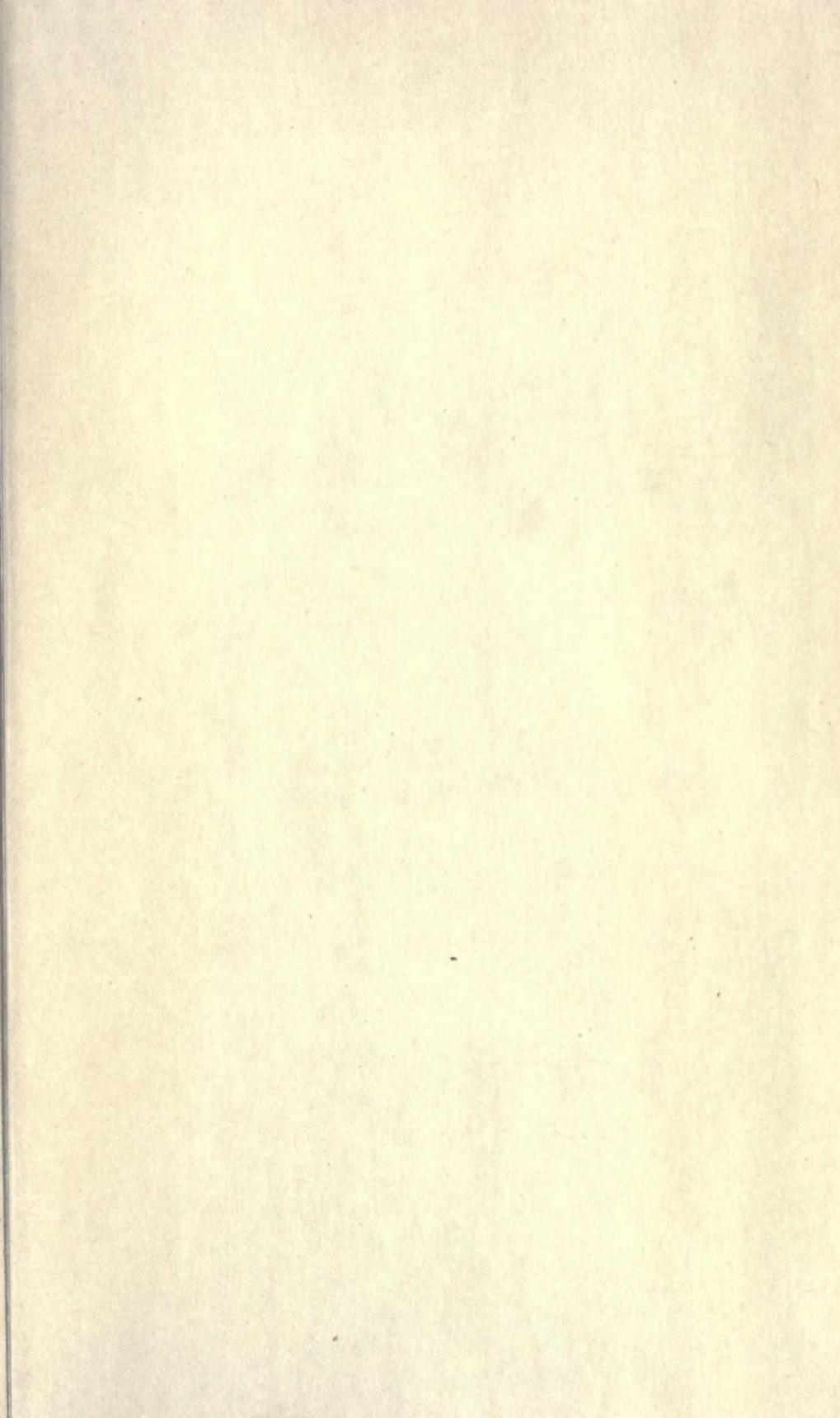
WEST VIRGINIA VETERINARY MEDICAL ASSOCIATION.

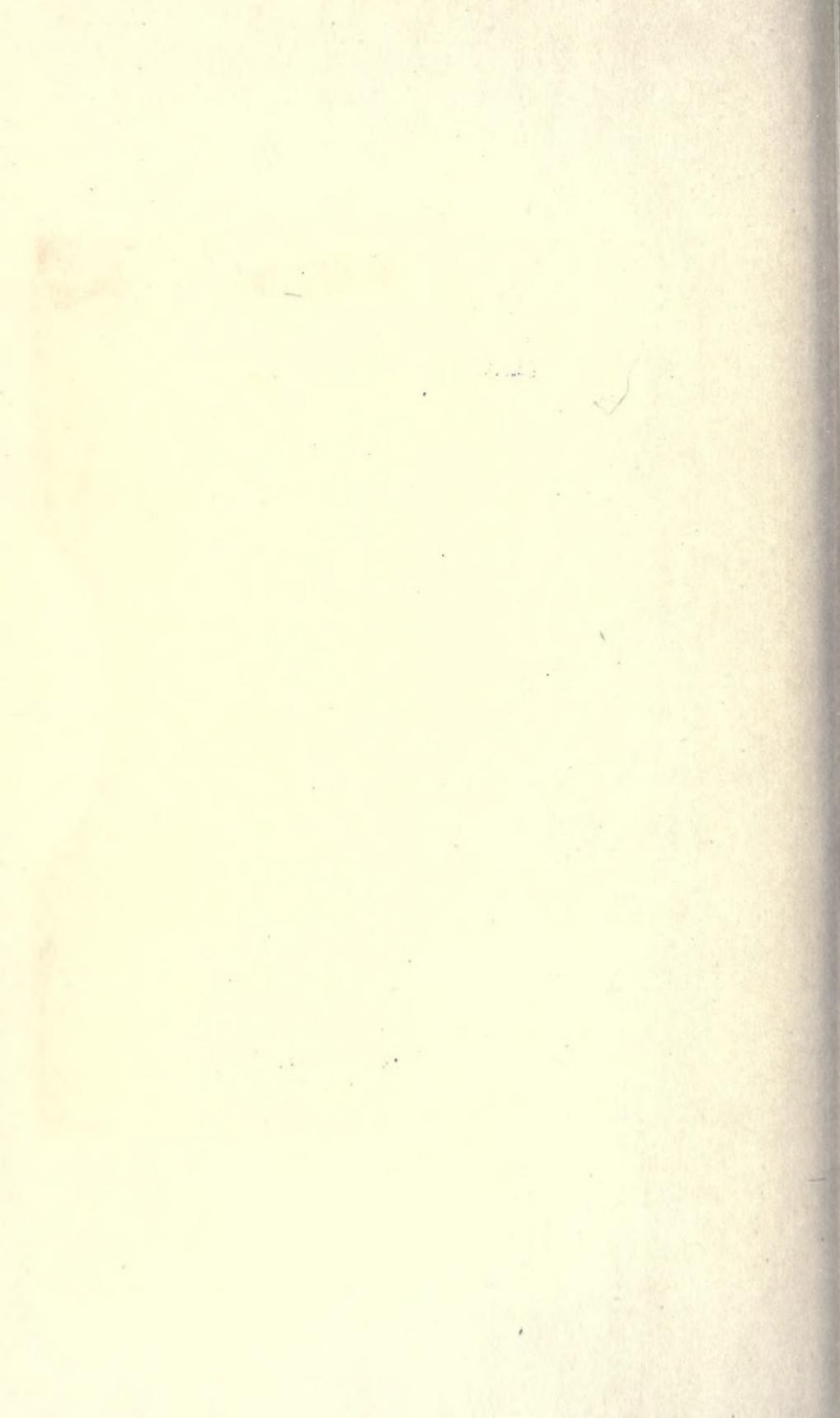
Annual meeting of the above association was held at Clarksburg, W. Va., on January 16th and 17th, 1911. Meeting called to order by the president, Dr. J. C. Callander, of Parkersburg, with Dr. Layne acting as secretary in place of Dr. Kavercombe, who had moved from the state. About twenty members were in attendance and several interesting sessions were held. The most important business transacted was the framing of a bill regulating the practice of the profession, to be presented to the legislature now in session at Charleston. Wheeling was selected as the place of next meeting in September, week of West Virginia State Fair.

L. N. REEFER, Secretary.









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